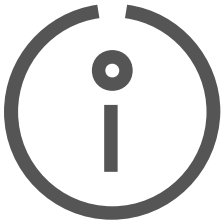
Mental Health Investment Case for South Africa

A bold vision for accelerating Economic Growth, Universal Health Coverage and Human Rights Protection through Integrated Investments in the Mental health and Well-being of the Nation

An Independent Initiative commissioned by the National Department of Health of South Africa



Mental Health Investment Case for South Africa

Final Report of the Mental Health Investment Case Task Team

produced by

Donela Besada, Sumaiyah Docrat & Crick Lund

in collaboration with

the National Department of Health of the Republic of South Africa

November, 2021

Disclaimers

Funding

The contents of this Report of the Mental Health Investment Case for South Africa, its' appendices and accompanying materials (hereinafter, collectively referred to as MHIC Report) has been supported by the South African Medical Research Council (SAMRC) with funds received from the Foundation for Professional Development (FPD). The National Department of Health (NDoH) generously provided financial support to enable travel for the Authors to conduct Provincial workshops as part of the extensive consultation processes that were undertaken. Additionally, the SAMRC supplied funding to cover all catering costs related to the Provincial workshops through the unit funding of its' Health Systems Research Unit (HSRU).

The funders of this MHIC Report had no influence on decisions regarding the methodology adopted, the study design, interpretation of findings or authorship of this MHIC Report. Nonetheless, the development of the Mental Health Investment Case for South Africa (MHIC) has been purposefully designed to enable intensified national dialogue about investment choices and priority setting involving key national, provincial, and non-governmental partners.

Consequently, the National Directorate: Mental Health and Substance Abuse, was consulted at various stages of the data collection and model development process. This facilitated a straightforward approach to solicit recommendations for model parameter adjustments; validate clinical assumptions, and adjust scenarios being considered because of the evolving COVID-19 pandemic. Access to stakeholders and datasets for the purpose of data gathering and assumption refinement was also facilitated by the support and permission of the NDoH and heads of the Provincial Departments of Health (Provincial Departments of Health)

General Disclosures

The contents of this MHIC Report are solely the responsibility of the Authors. The designations employed and the presentation of material in this publication (and its associated products) do not imply the expression of any opinion whatsoever on the part of the NDoH, Provincial Departments of Health, the SAMRC, the University of Cape Town (UCT), Kings College London (KCL), or the FPD.

All reasonable precautions have been taken by the Authors to verify the information contained in this MHIC Report. However, the material is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the material lies with the reader.

Limitation of liability

The Authors, the NDoH, Provincial Departments of Health, SAMRC, UCT, KCL, or the FPD or their affiliates, shall not be liable for any direct or indirect, consequential or special liability arising out of or in any way related to the use or interpretation of this MHIC Report, whether such liability is under contract, tort or otherwise. In no event shall the Authors, the NDoH, Provincial Departments of Health, SAMRC, UCT, KCL, or the FPD or their affiliates be liable for damages arising from its use.

Intellectual property

All Intellectual Property (IP) used and generated in connection with this MHIC Report shall remain the property of Authors. All Foreground IP within the Field shall be the sole property of the Authors who may use the same as it considers appropriate.

Permissions

The Authors grant the South African Government and its subsidiaries a perpetual, non-exclusive, non-transferable license to reproduce and use this MHIC Report, in each case solely for non-commercial purposes. The Authors retain all right, title, and interest in this MHIC Report. The rights granted to South African Government are for usage of the MHIC Report in its final form only. The South African Government and its subsidiaries may not crop, distort, manipulate, reconfigure, edit, or alter the final MHIC Report, or otherwise create derivative MHIC Reports based on the Final MHIC Report, unless such alternations are accepted by written agreement by the Authors.

Publicity

The Authors retain the right to publish scientific and academic papers, participate at conferences, collaborate with the scientific community and public discourse, reproduce, and/or distribute a copy of all or any part of the MHIC Report and nothing provided herein, will prevent either party from (a) making and continuing to make any statements or other disclosures it deems required, prudent or desirable, or (b) engaging in oral discussions or oral or written presentations regarding the subject matter of this MHIC Report.

Attribution

The South African Government agrees to include in all displays, public, written and/or oral announcements or publications of the Final MHIC Report attribution in the Authors' names in the form and conventional location as incorporated by the Authors in this MHIC Report, or as otherwise directed by the Authors.

Third-Party Materials

Please note that aspects of this MHIC Report make use of third-party materials (such as data, tables, or figures). Reuse of any material contained in this MHIC Report and attributed by the Authors to a third party may require the permission of the copyright holder. The risk of claims resulting from infringement of any third party-owned component in the MHIC Report rests solely with the user.

Table of Contents

APPENDICES

To view, open or save the Appendices: Double-click the file attachment (paperclip) icon on the left side of the Acrobat user interface. This will open up the Attachments" pane on the left side of the screen with all the Appendices (attachments) visible. Double click on the Attachment to open it.

List of Tables

List of Figures

Executive Summary

This Mental Health Investment Case for South Africa, commissioned by the National Department of Health in November 2019, represents the result of three years of sustained dialogue and collaboration with the National Department of Health, involving key Provincial partners, clinicians, financing experts, patient rights and community advocacy groups and prominent academics, all of whom are committed to upholding the rights of persons living with Mental, Neurological and Substance use Disorders in South Africa.

Although the health system of South Africa has made significant strides since democracy, our collective efforts have not addressed the complexity of problems our mental health system encounters, nor have these efforts paid due recognition to the significant and growing burden of mental illness in our country. Further, the post-apartheid society of today continues to be characterized by structural concerns that entrench poor mental health among certain groups, in particular, among the most disadvantaged in our society.

Calls to improve and scale-up investments in a broad range of proven promotion, prevention and treatment interventions for mental health have been articulated widely over the past two decades. Beyond health benefits, these actions have been shown to yield impressive benefits to our collective social well-being and the broader economy. Technical guidance to support the development, financing, and implementation of an accessible, equitable and comprehensive mental health care system, integrated at all levels of the health system is urgently needed.

The purpose of this Mental Health Investment Case (MHIC) is to share a 15-year vision for meeting the mental health and economic needs of South Africa, offering concrete recommendations for how to achieve these gains. This Investment Case draws significantly on the guidance of Global actors including the World Health Organization (WHO), the World Bank (WB) and the United Nations Development Program (UNDP). The timing of the MHIC Task Team's work has overlapped with the passing of the NHI Bill, the ongoing development of the Service Benefits Framework (SBF), the drafting of the next Non-communicable Disease (NCD) National Strategic Plan, the Life Esidimeni Arbitration Award and the publication of the Report on the National Investigative Hearing into the Status of Mental Healthcare in South Africa.

Most significantly, the MHIC development has overlapped with the unprecedented COVID-19 pandemic that first gripped South Africa in March 2020. The significant shock to our health system, our country's well-being and intensifying impact on our fiscal climate is undeniable. However, as demonstrated through this report, this crisis has highlighted the critical importance of mental health and mental well-being for South Africa, creating an unprecedented opportunity to build back better. Globally, governments have been galvanized to prioritize mental health as an integral part of their COVID-19 response plan.

Formative work conducted by the MHIC Task Team, in collaboration with the National and Provincial Departments of Health, highlighted a significant treatment gap of over 90%, meaning that less that 1 in 10 people in need of mental health care are getting the care they need. This is despite approximately ZAR 8 billion, or 5% of our health budget being spent on mental health services.

Rising to the challenge today can create a system that sustains our resources and generates significantly greater benefits for our nation. A historic opportunity is at hand to make positive and lasting changes. While devastating, the COVID-19 pandemic in South Africa ignited a long-awaited impetus for rethinking our roadmap to universal health coverage in the years to come. Ultimately, the development of the MHIC is intended to support a budget bid for a conditional grant for mental health in the medium term, identifying key priorities to advance the mental health system to an acceptable level and build capacity for the Provincial Departments to address key system constraints thereby ensuring our future health system under NHI is responsive to mental health care needs.

The findings contained herein signal the need for significant new investments in the mental health system and illustrates that government, private sector, and development partners all can play a contributory role. The report provides independent, evidence-based advice that has been informed by engagement with a diverse range of stakeholders. While this MHIC is specific to South Africa, the challenges are common across the world. The fragility of mental health systems worldwide has been exposed and there are growing global calls for investment in mental health. Each country will consider the most appropriate arrangements to address the long-lasting mental health issues that will follow in the wake of the pandemic's devastation; however, in South Africa we have an opportunity to lead the global effort and place mental health at the core of our recovery efforts.

Approach

In this Investment Case we conduct an analysis to estimate the expected return-on-investment (ROI) over a 15-year period from scaling up interventions targeting anxiety, depression (including perinatal depression), psychosis, bipolar disorder, epilepsy, idiopathic developmental intellectual disability, behavioural disorders, dementia, alcohol, and drug use as well as risky alcohol and substance-use. The investment case examines the costs and benefits of scaling up treatment for these conditions, and quantifies the infrastructural, human resource and programmatic requirements that should be in place for the achievement of mental health service scale-up.

We use the WHO Inter-UN OneHealth Tool, developed by UN partners, along with an excel-based model, to cost clinical treatment and rehabilitation interventions, and to project the health benefits expected from their implementation over a fifteen-year period. We then estimate the total economic and social value of these health benefits. Benefit-cost ratios (return on investments) are then estimated for each package of interventions. Whilst the traditional core focus of the Investment Case approach seeks to identify the most cost-effective mix of interventions, the MHIC for South Africa has considered a series of arguments for investing in mental health, including those based on human rights protection, equality of access, efficiency and the consideration of the economic rationale to formulate a more robust case for investment. Further, the process undertaken has facilitated the identification of priorities across a broad range of stakeholders whilst being sensitive to the feasibility of implementation in the light of the baseline service delivery environment, the macro fiscal climate and structural changes to our health financing arrangements.

Methodological Innovations

Building on the global methodological guidance, this Investment Case has introduced several methodological innovations:

Collaborated with Provincial Departments of Health to facilitate interactive, multi-sectoral workshops in Provinces to feed back the results of the 2018 national survey on mental health system costs, resources and constraints in South Africa and to obtain Province-specific experiences, constraints, priorities and solutions for mental health service delivery.

Incorporated a broad consultation with a panel of multidisciplinary experts across the country through a Delphi study in order to obtain consensus on what core set of interventions and programmatic activities should be prioritized for addressing the mental health burden in South Africa and achieve the goals linked to the Mental Health Policy Framework and Human Rights Commission Report recommendations.

Considered programmatic enablers (e.g. governance structures, training needs, interhospital transport costs) that should be in place for the achievement of mental health service scale-up in the country.

Considered infrastructural and human resource requirements associated with residential and day-care community-based rehabilitation services.

Considered infrastructural investments required to upgrade or establish inpatient psychiatric units at the district and regional hospital level(s) and infrastructure for forensic mental health services.

Estimated human resource needs for the primary health care level for services delivered through general health facilities.

Enumerated the needs and costs of preventative actions including population-based social emotional learning programmes targeting learners in schools and early intervention for risky alcohol- and substance-use

Modelled the redistribution of inpatient and outpatient care for mental health over time towards an increased decentralized model of care

Enumerated the costs of health promotion efforts through a radio-based mass-media campaign.

Quantified the costs associated with Planned Patient Transport for Interfacility Transfers of Mental Health Care Users (MHCUs) rendered through the Emergency Medical Service (EMS) for health system referrals.

Considered the unique costs that should be borne by different sectors for mental health service delivery in alignment to their mandates and responsibilities

Key Findings

Treatment Gap & Coverage Targets

An estimated 9,548,875 people are currently living with an MNS disorder in South Africa, representing an overall annual prevalence of approximately 16%. Figure ES1 presents the proportion of years lost to disability due to MNS disorders and provides a breakdown of the contributions of specific disorders to this burden.

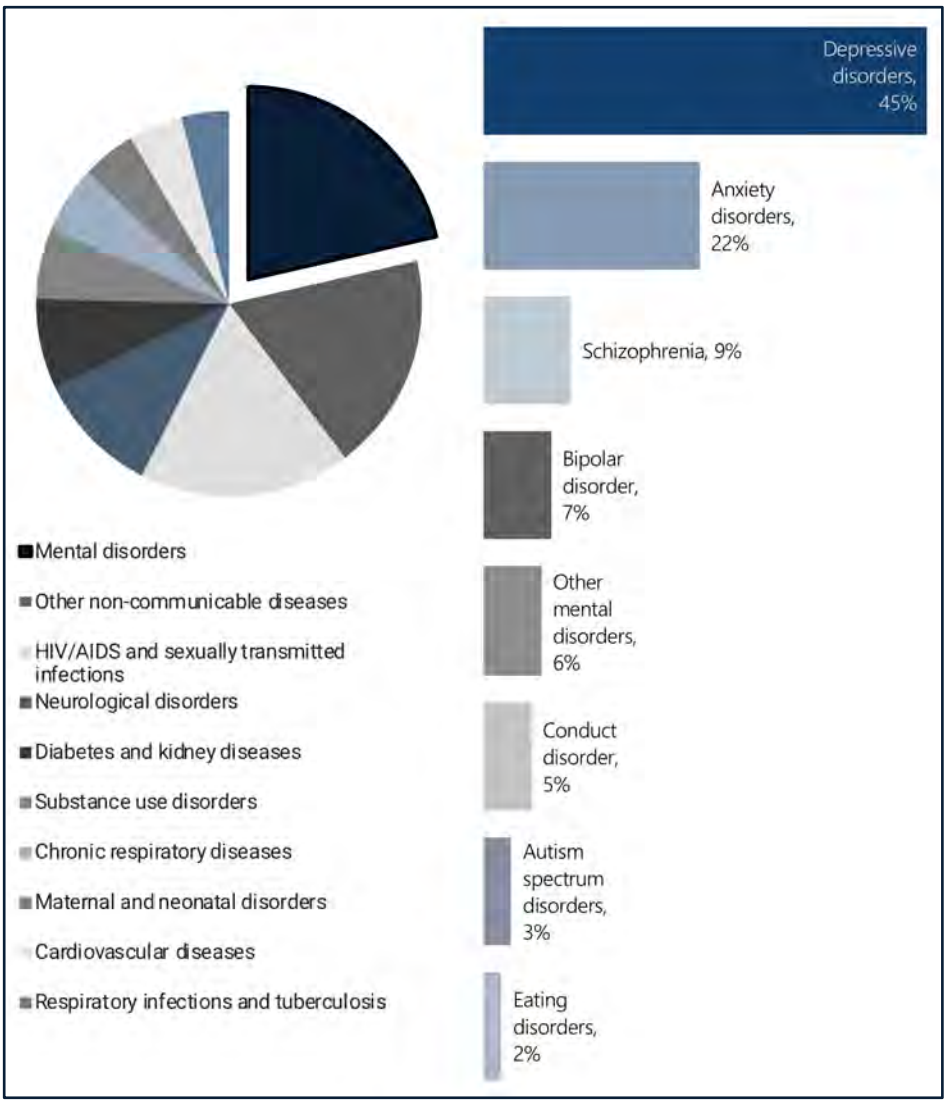


Figure ES1 Years Lost to Disability by Cause, South Africa (2019)

The current treatment gap has been estimated to be over 90%; current treatment coverage modeled in this analysis is 7.5%. Furthermore, approximately 27% of the population (11,337,799 people) has been estimated to be risky alcohol and substance users, with a 5% baseline estimated coverage for the provision of screening and brief interventions for identified cases. At the end of the scale-up period, treatment coverage is modeled to reach 33% across all MNS disorders, and 30% for risky alcohol and substance-users.

The modelled population of school going children between the ages of 12-17 that would receive a newly introduced Socio-emotional learning programme is 6,251,601. Of these, 5% are assumed to have sub-threshold anxiety or depression. Universally delivered programmes would target all school-going children, while the indicated intervention would only target those with sub-threshold depression and anxiety. Scaling up this intervention to 91% of schools would translate into an 85% coverage of learners for both universal and indicated school-based interventions.

The scale-up of mental health services will incorporate a gradual redistribution of hospi-centric mental health care towards the primary health and community service levels. This results in additional cost savings to the health sector on account of reduced needs for expensive inpatient services. This is particularly notable in our setting, with most hospitals reporting extremely long lengths of stay for patients. The average cost of treatment over time is evaluated to determine the cost-savings on account of increased decentralization of services, ensuring sufficient infrastructure for upward referrals and the gradual development of an integrated community-based service landscape to allow for discharge after acute stays coupled with ongoing comprehensive support post-discharge. This approach intends to break revolving door patterns of care reflective of our current service delivery landscape.

Efficiency and Cost Savings

To account for a gradual and rational redistribution in service delivery over time, inpatient and outpatient services in the base year were assumed to be distributed in line with the baseline service delivery channels determined by the formative costing study[3]. For each year of the scale-up period, increased service provision for outpatient services were modelled for the primary health care level to a maximum of 80% for most disorders, except for alcohol- and substance-use disorder withdrawal and prevention services, provided for at the hospital levels. Coverage changes at the hospital levels are decreased gradually over time, as increased service provision at the PHC level takes place, and programmatic investments in training and other enablers are put in place (Figure ES2).

For each year of the scale-up period, increased service provision for acute inpatient stays were applied equally at the district and regional hospitals, in alignment with the recommendations of our technical review panel, whilst longer term stays were distributed across the higher levels of care; capped at the maximum hospital capacity currently existing in South Africa.

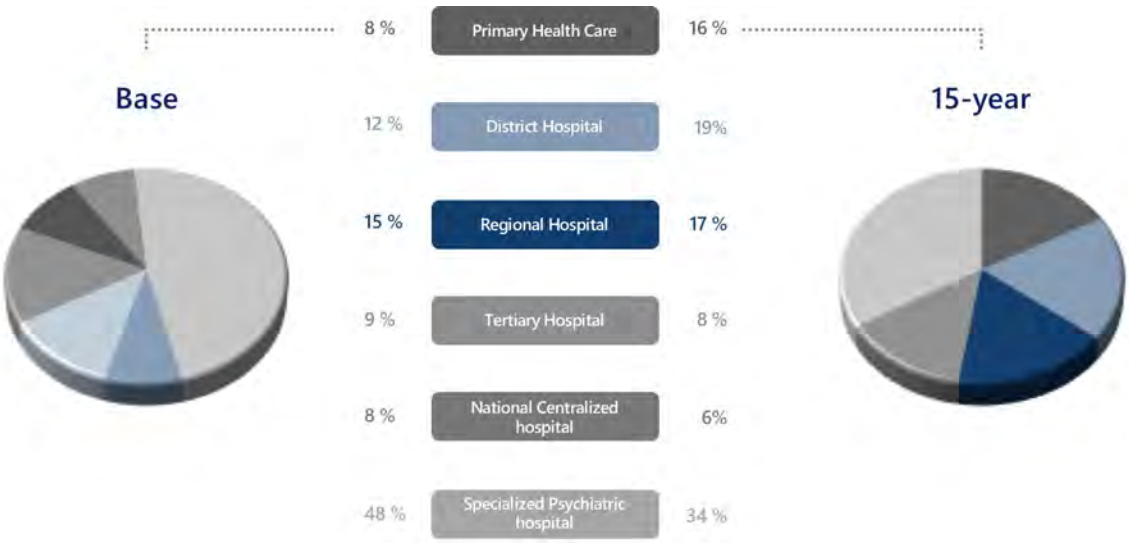


Figure ES2 Service Distribution by Service Level, Base vs 15-year

People Reached, Costs, Health impacts & Return-on-Investment (ROI) over 15 years

The scale-up of mental health services over the 15-year period is expected to result in a 5.3-fold increase in the number of persons in need who receive care, on average, from an estimated 731,872 cases reached to 3,885,596 cases reached by the 15-year milestone (Figure ES3). The scaling up of brief interventions for persons identified with risky and harmful alcohol and substance-use translates into an almost 6.6-fold increase in those receiving early intervention, from a baseline estimate of 562,806 people to an estimated 3,700,466 people over the scale-up period. The development, implementation and scale-up of social-emotional learning programmes for school-going children (12-17 years) translate into an almost two-fold increase in learners between the 3rd (i.e. the first year of implementation) and the 15th year milestone. By the end of the scale-up period, a total of 5,973,406 learners are estimated to have been reached, 4.8% of which are likely to have sub-threshold depression symptoms. Annual forensic cases are estimated to remain consistent, increasing only by average population growth, over the 15-year scale-up period.

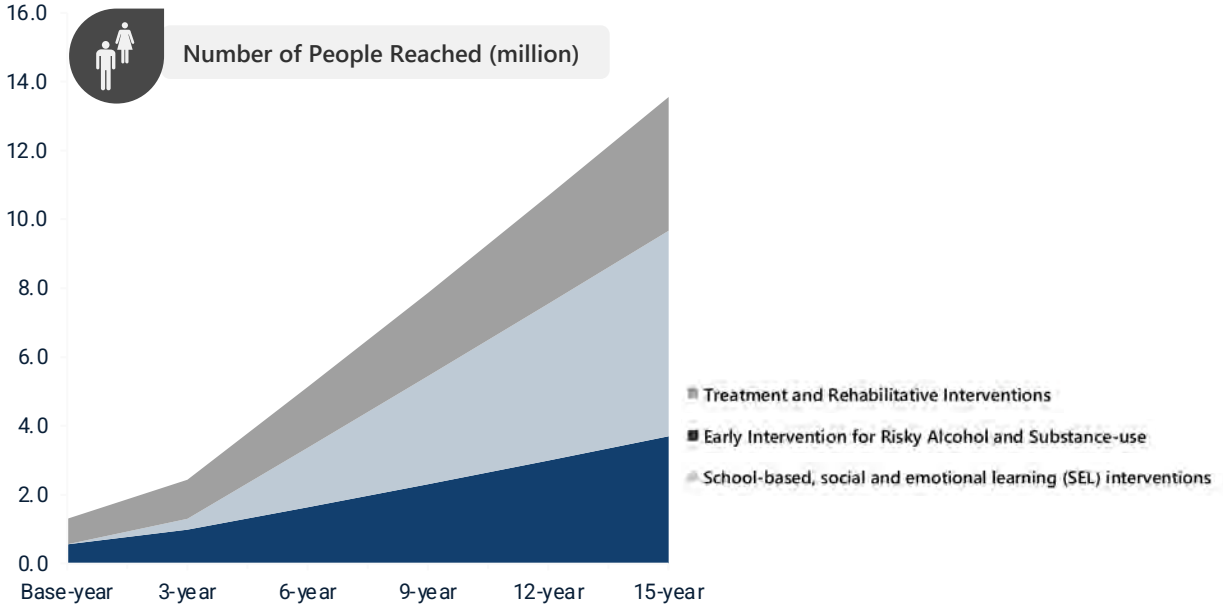


Figure ES3 Cumulative Number of People Reached, Base vs 15-year

In relation to *costs*, the total investments required by the Department of Health amount to approximately ZAR 327.3 billion (ZAR 248 billion net present value) over the scale-up period, while total costs over the scale-up period for the provision of forensic services amounts to 55.2 billion (50 billion net present value). These costs translate to an average annual expenditure of ZAR 21.8 and ZAR 3.7 billion respectively. Together, these costs translate to 11% of the current health budget of ZAR 224.7 billion.

The health budget was conservatively projected for the scale-up period, assuming no growth for this MTEF period and a subsequent 2% growth thereafter only accounting for population growth. These total costs reflect 9% of the modelled budget in 2035, estimated at ZAR 285 billion. When looking at the net-present value of the total investment required, costs would amount to 9% and 7% of the current and projected health budget. It has been estimated that to match the most comprehensive mental health systems in the world, countries should expect to allocate up to 10% of the total health budget to mental health, and therefore our estimates fall within recommended norms.

Assuming that existing grants and health budget line items bear the costs for infrastructure investments as well as planned patient transport, and therefore only considering direct service provision, training, supervision, governance and behaviour change campaigns be considered within a mental health conditional grant, this amount would translate to a requirement of ZAR 309 billion over the scale-up period or an annual allocation of approximately ZAR 21 billion. In the first MTEF period, these direct service delivery costs amount to an annual average investment of ZAR 6.7 billion; in comparison, currently estimated expenditure on mental health services based on the national costing exercise, after inflating to 2020 costs amount to ZAR 8.1 billion. Table ES1 compares the investment case appropriation estimate for the above mentioned cost components (borne by the Department of Health) with the current estimated expenditure on mental health services in South Africa.

	Medium Term Department of Health Appropriation Estimates per MTEF period over 15-year scale-up ZAR, million				
Appropriation Estimates per MTEF	MTEF 1	MTEF 2	MTEF 3	MTEF 4	MTEF 5
Projected Existing Resource Envelope	24,850	26,371	27,986	29,699	31,516
Investment Case Resource Needs	26,072	43,525	61,318	78,862	99,379
Estimated Additional Request	+1,222	+17,154	+33,333	+49,164	+67,863

Table ES1 Current vs. Projected Medium Term Appropriation Estimates for Department of Health

Assuming a 2% annual increase for population growth for each MTEF period, the estimated deficit between the current resource envelope for mental health services and the projected resource envelope required for scale-up estimated within this analysis is outlined. As indicated, during the first hypothetical MTEF period, the investment deficit is minimal (ZAR 1.2 billion). By the final MTEF period, as population coverage expands significantly, the deficit grows to ZAR 68 billion.

For the community-based service platform, personnel providing rehabilitation support both within-day and residential centres are paid through the Department of Health, whilst the Department of Social Development provides subsidies for individuals living with mild to moderate intellectual disability. The total value of the estimated subsidies over the scale-up period amount to approximately 476.32 million (340.15 net present value, or an average annual estimate of 31.75 million in real terms).

Furthermore, the Department of Social Development has the mandate over the provision of substance-use rehabilitation centres which have been estimated to amount to ZAR 3.43 million in capital costs over the scale-up period or an average annual estimate of ZAR 2.30 million. All acute withdrawal services for both alcohol and substance-use disorders are assumed to be managed within hospital settings and fall under the responsibility of the Department of Health, in alignment to current treatment guidelines. The inpatient costs associated with managing long term stays at substance abuse treatment centers for opioid and non-opioid withdrawal are however assumed to be borne by the Department of Social Development; estimated to amount to ZAR 7.3 billion over the scale-up period or an average annual estimate of ZAR 484 million. Together, the appropriation estimates for mental health for the Department of Social Development amount to an average annual expenditure of ZAR 518 million, over the scale-up period; translating to 0.23% of the budget of ZAR 226.89 billion for the 2022/23 period.

The Department of Basic Education would be expected to fund the social and emotional learning programmes modelled in this analysis. The delivery of indicated or universal SEL programmes are estimated to amount to 3.22 and 3.20 billion respectively over the scale-up period (2.45 and 2.44 billion net present value). The average annual expenditure of 214 million translates to approximately 1% of its allocated budget of ZAR 28.59 5 billion in the 2022/23 period.

In light of the mandate of the Department of Human Settlements to provide housing needs for vulnerable populations, the capital costs estimated for the establishment of residential units would be borne directly by this department. These costs amount to ZAR 13.42 billion over the scale-up period (9.63 billion net present value). The estimated average annual investment of 895 million translates to just under 3% of its allocated budget of ZAR 32.79 billion in the 2022/23 period.

Total population health gains over the 15-year scale-up period are illustrated in Figure ES3. Health impacts of scale-up for mental health care increase over time on account of the incremental increases in coverage. By the end of the scale-up period, approximately 2.2 million years of healthy life will be restored through the provision and scale-up of treatment and rehabilitative services, with close to 2.5 million prevalent cases averted and over 44,000 deaths avoided. The relatively modest number of deaths averted is on account of the nature of MNS disorders, placing a substantially higher burden on morbidity than mortality. Through early interventions for risky alcohol and substance-use, 286,439 years of healthy life will be restored, with 773,155 prevalent cases averted and almost 40,000 deaths avoided. Given the high prevalence of risky alcohol-use, depression, anxiety and perinatal depression, the health impacts of scaled-up interventions addressing these disorders are proportionally greater. Universal SEL programmes contribute significantly to averting prevalent cases of depression and anxiety, resulting in over 415,000 cases averted, in addition to achieving over 89,000 healthy life years gained.

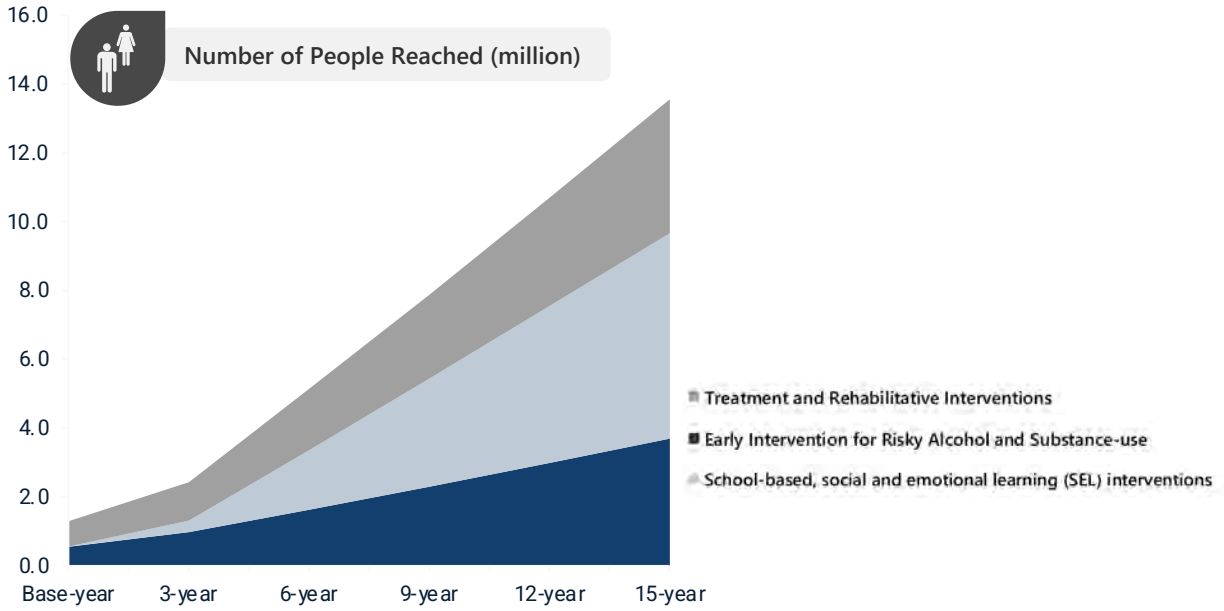


Figure ES3 Cumulative Number of People Reached, Base vs 15-year

Total population health gains over the 15-year scale-up period are illustrated in Figure ES4. Health impacts of scale-up for mental health care increase over time on account of the incremental increases in coverage. By the end of the scale-up period, approximately 2.2 million years of healthy life will be restored through the provision and scale-up of treatment and rehabilitative services, with close to 2.5 million prevalent cases averted and over 44,000 deaths avoided.

The relatively modest number of deaths averted is on account of the nature of MNS disorders, placing a substantially higher burden on morbidity than mortality. Through early interventions for risky alcohol and substance-use, 286,439 years of healthy life will be restored, with 773,155 prevalent cases averted and almost 40,000 deaths avoided. Given the high prevalence of risky alcohol-use, depression, anxiety and perinatal depression, the health impacts of scaled-up interventions addressing these disorders are proportionally greater. Universal SEL programmes contribute significantly to averting prevalent cases of depression and anxiety, resulting in over 415,000 cases averted, in addition to achieving over 89,000 healthy life years gained.

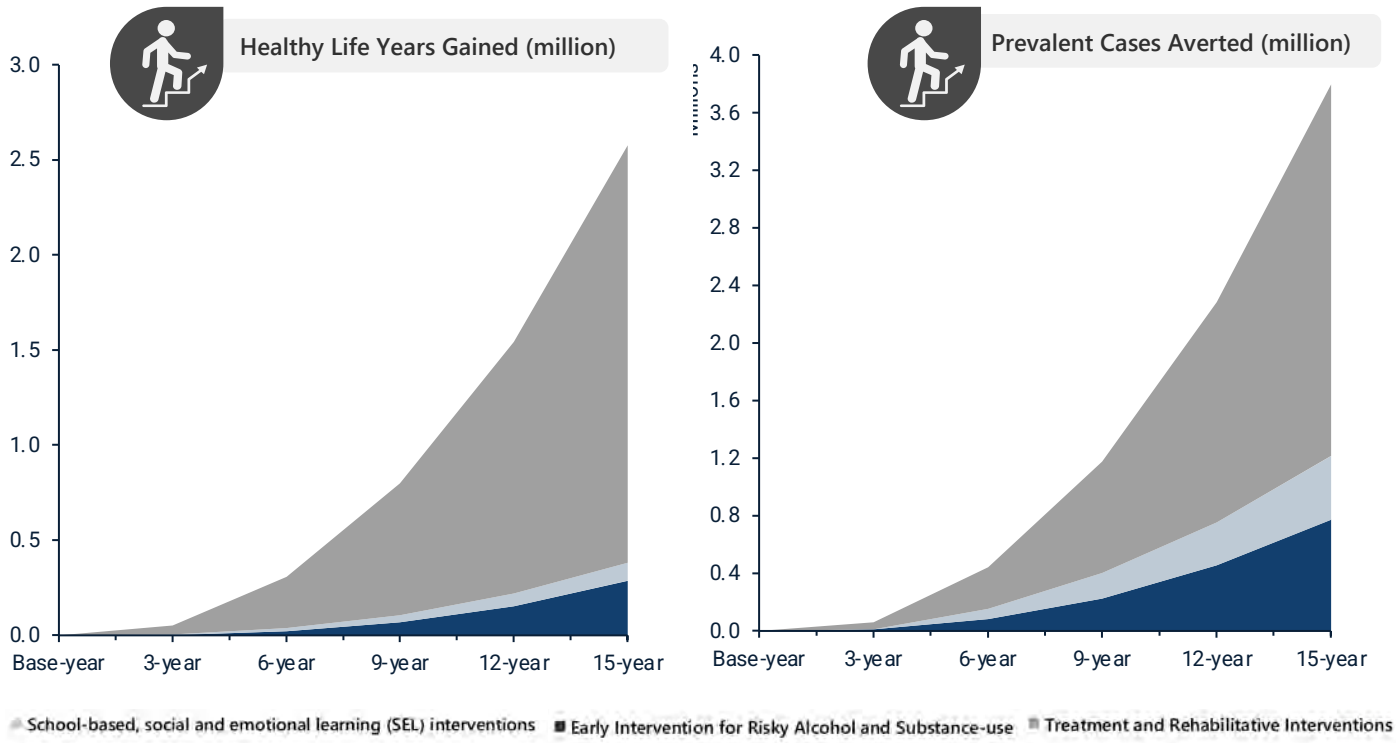


Figure ES4 Cumulative Healthy Life Years Gained and Prevalent Cases Averted, Base vs 15-year

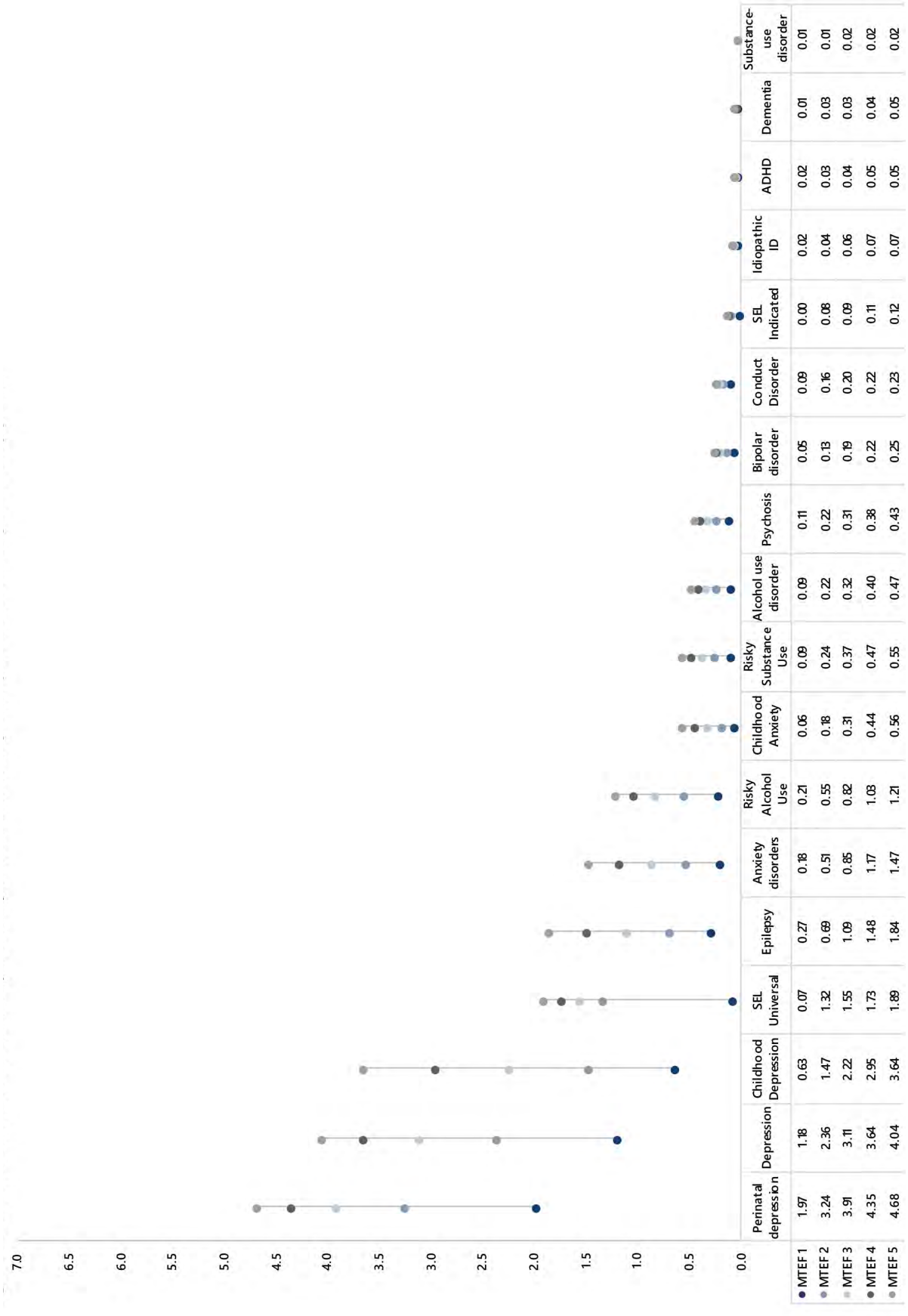
In terms of *Return on Investment* (ROI) it is estimated that the economic value of restored productivity over the 15-year scale-up period amounts to ZAR 60.2, and ZAR 117.7 billion when quantifying the social value of the investment as well. Whilst this overall value is lower than the expected investment for scale-up, amounting to approximately ZAR202.7 billion, when reflecting on these ratios specifically for each disorder, many disorders show returns that exceed the investments required for scale-up; any benefit-to-cost ratio exceeding 1 is indicative of a valuable investment. . These largely relate to interventions for adult anxiety, with returns on investment estimated at 1.5, with returns on investment for adult, childhood and perinatal depression estimated at 4.0, 3.6 and 4.7 respectively. Additionally, the return on investment estimated for epilepsy is 1.8.

The total economic value of restored productivity by scaling up interventions addressing risky alcohol and substance use amount to ZAR 15.3 billion and ZAR 22.7 billion when also accounting for the economic value of improved health. This is in comparison to the 23.9 billion estimated costs of delivering these interventions over the scale-up period. Brief interventions for alcohol-use result in a positive return-on-investment when considering both the economic and social values of improved health, estimated at 1.21 at scale-up, whilst this is not estimated for brief interventions for substance-use, estimated at 0.55.

Further scale-up for alcohol and substance use interventions will likely be warranted to yield increased economic benefits. The economic value of restored productivity modelled for indicated social and emotional learning programmes is 139.6 million and 288 million once accounting for the value of improved well-being. The economic value of restored productivity and the combined value of productivity and improved well-being for universal social and emotional learning programmes is 2.2 billion and 4.6 billion respectively.

The returns on investment for providing universal social-emotional learning programmes yield positive returns on investment of 1.9; this intervention represents extremely good value for money, particularly on account of the significant number of prevalent cases that are averted through the intervention.

Figure ES5 illustrates the returns-on-investment for each modelled condition over each MTEF period, as coverage is scaled-up. From the first MTEF period, positive returns on investment are achieved for adult and perinatal depression, and by the second MTEF period, positive returns are also achieved for childhood depression and universal social and emotional learning programmes delivered in schools as well. By the third MTEF period, treatment for epilepsy demonstrates a positive return on investment, and by the 4th MTEF period, interventions for adult anxiety and risky alcohol use demonstrate positive returns on investment. All ROIs show a steady increase as increased coverage is achieved.



	Perinatal depression	Depression	Childhood Depression	SEL Universal	Epilepsy	Anxiety disorders	Risky Alcohol Use	Childhood Anxiety	Risky Substance Use	Alcohol use disorder	Psychosis	Bipolar disorder	Conduct Disorder	SEL Indicated	Idiopathic ID	ADHD	Dementia	Substance-use disorder
MTEF 1	1.97	1.18	0.63	0.07	0.27	0.18	0.21	0.06	0.09	0.09	0.11	0.05	0.09	0.00	0.02	0.02	0.01	0.01
MTEF 2	3.24	2.36	1.47	1.32	0.69	0.51	0.55	0.18	0.24	0.22	0.22	0.13	0.16	0.08	0.04	0.03	0.03	0.01
MTEF 3	3.91	3.11	2.22	1.55	1.09	0.85	0.82	0.31	0.37	0.32	0.31	0.19	0.20	0.09	0.06	0.04	0.03	0.02
MTEF 4	4.35	3.64	2.95	1.73	1.48	1.17	1.03	0.44	0.47	0.40	0.38	0.22	0.22	0.11	0.07	0.05	0.04	0.02
MTEF 5	4.68	4.04	3.64	1.89	1.84	1.47	1.21	0.56	0.55	0.47	0.43	0.25	0.23	0.12	0.07	0.05	0.05	0.02

Figure ES5 Benefit-to-Cost Ratios of restored productivity and health to cost by MTEF period over the 15-year scale-up period

A model for community day and residential services

Past research has established that South Africa's community mental health system remains underdeveloped, requiring substantial investments to build up the platform and strengthen intersectoral collaboration. The day and residential care model aims to lay the foundations for an intersectoral and collaborative service package to improve care for people with severe mental and neurological disorders moving across the health system and into the community (see Figure ES6, ES7). The model adopts the notion of disability inclusive development and proposes a rehabilitation framework for care as a poverty reduction strategy, and therefore draws heavily on the use of occupational therapy as a fundamental component of community mental health service delivery.

The core service package of community-mental health services modeled in this analysis includes i) residential and day care services, in collaboration with the Department of Social Development and NPOs; ii) psychosocial and rehabilitation services, iii) mental health literacy and self-care, iv) medication adherence support, and v) capital investments through the Department of Human Settlements in alignment to their special housing policy.

There exists a promising opportunity to draw on the support and experiences of the numerous non-profit organisations (NPOs) operating within South Africa's mental health system and develop a standardised package of person-centred care within these facilities, that provide a spectrum of appropriate and comprehensive services according to population need. This requires a revision of the current regulation and licensing regulations of these NPOs, to enable a formal network of care that includes government and non-government services including drawing on the support of voluntary organisations, such as churches, faith-based and secular groups promoting health and well-being.

Community-based Day-care Service

Modelled Service & People in Need

Target Population	Proportion Requiring Day-care Services
Bipolar disorder, 15+ years	7.5%
Psychosis, 15+ years	7.5%
Dementia, 40+ years	10%
Idiopathic developmental intellectual disability, 1+ years	20%

All day-care clients are provided with 100 days of day-care per year. Rehabilitative services are delivered by a full-time Occupational Therapist Assistant to 30 users per facility. The OTAs receive monthly support from an Occupational Therapist who will visit once a month for half a day to co-develop recovery/rehab orientated interventions which are crafted for each individual. A full-time social worker manager is also provided per day-care facility. NB: Health care and medication costs are subsumed within the cost-of-treatment modelled through the treatment and rehabilitative interventions

Staff Composition and Cost Assumptions

Staff Cadre	Cost of Employment (ZAR, Net Present Value)	Full Time Equivalent Ratio per 30 person service per year
Social Worker Manager (grade 2)	377,341	0.74
Occupational Therapist Assistant (grade 2)	200,505	0.74
Occupational Therapist (grade 2)	377,341	0.012

Target Population	Value of per diem overhead unit cost
Bipolar disorder, 15+ years	ZAR 73
Psychosis, 15+ years	ZAR 73
Dementia, 40+ years	ZAR 73
Idiopathic ID, 1+ years	ZAR 73

A per diem "overhead" unit cost is then added for each day-care client receiving care per year, calculated as the monthly day-care subsidy paid by each province for the different categories of mental health clients divided by 20 days, then multiplied by the frequency of days attended (i.e. 100 days per year per person in need)

Figure ES6 Community-based Day-care Service: Target Population, Staffing and Cost Assumptions

Community-based Residential Service

Modelled Service & People in Need

Target Population	Proportion Requiring Residential services
Bipolar disorder, 15+ years	2.5%
Psychosis, 15+ years	2.5%
Dementia, 40+ years	10%
Idiopathic developmental intellectual disability, 1+ years	3.6%

All residents are provided with 365 inpatient days in a community residential facility per year. Rehabilitative services are delivered by a full-time Occupational Therapist Assistant to 30 residents per facility. The OTAs will receive weekly support from an Occupational Therapist who will visit once a week for half a day to co-develop recovery/rehab orientated interventions which are crafted for each individual. A full-time social worker manager is also provided. A Professional Nurse will visit each facility once a month to provide medication management and support to residents and staff, spending an average of 15 minutes per person per residential facility. NB: Health care and medication costs are subsumed within the cost-of-treatment modelled through the treatment and rehabilitative interventions

Staff Composition and Cost Assumptions

Staff Cadre	Cost of Employment (ZAR, Net Present Value)	Full Time Equivalent Ratio per 30 person service per year
Social Worker Manager (grade 2)	377,341	2.85
Occupational Therapist Assistant (grade 2)	200,505	2.85
Occupational Therapist (grade 2)	377,341	0.19
Professional nurse (grade 2)	424,467	0.084

Target Population	Value of per diem accommodation unit cost
Bipolar disorder, 15+ years	ZAR 106
Psychosis, 15+ years	ZAR 106
Dementia, 40+ years	ZAR 159
Idiopathic ID, 1+ years	ZAR 159

A per diem "accommodation" unit cost is then added for each resident receiving care per year, calculated as the monthly subsidy paid by each province for the different categories of residents divided by 30 days, then multiplied by the length of stay (i.e. 365 days)

Figure ES7 Community-based Residential Service: Target Population, Staffing and Cost Assumptions

Health system strengthening

Many investment cases and economic evaluations, both for mental health and other health priorities, have failed to account for the costs associated with implementation, leading to an underestimation of what is really needed to achieve the social and economic returns demonstrated through modelling approaches. With a view to improve planning for service change, we provide a candid review of the full range of costs and actions required for the successful implementation of the intervention packages modelled in this Investment Case.

We enumerate the investments needed for capital infrastructure, governance structures, planned interfacility patient transport, primary health care provider training and supervision mechanisms and health promotion efforts - as agreed by expert consensus, provincial or National stakeholders' consultations, the recommendations of the Human Rights Commission, and current policy. Given the extensive efforts and consultations that have taken place in order to generate these estimates, we outline in detail many of the assumptions and data sources that have underlined our calculations, to enable both the consideration of alternative scenarios for implementation and to ensure full transparency.

Cost of inaction

It has been well established that mental illness not only impact the health and well-being of affected persons and their families; but imposes significant economic consequences for employers and governments, resulting from diminished productivity at work, reduced rates of labour participation, foregone and increased welfare payments. An estimated US$2.5–8.5 trillion was estimated in lost output resulting from MNS disorders; this sum is expected to nearly double by 2030 without significant investment in treating mental disorders.

Lost days of work on account of illness and premature mortality according to each MNS disorder in South Africa have been estimated, after accounting for unemployment and labour force participation. the economic value of lost days of production amounts to 2.4 trillion (1.9 trillion NPV), estimated at a yearly average of ZAR 161 billion; this equates to approximately 4% of the country's GDP. The combined economic value of this lost productivity greatly exceeds the estimated cost of current mental health expenditure and the projected service scale-up (Figure ES8).

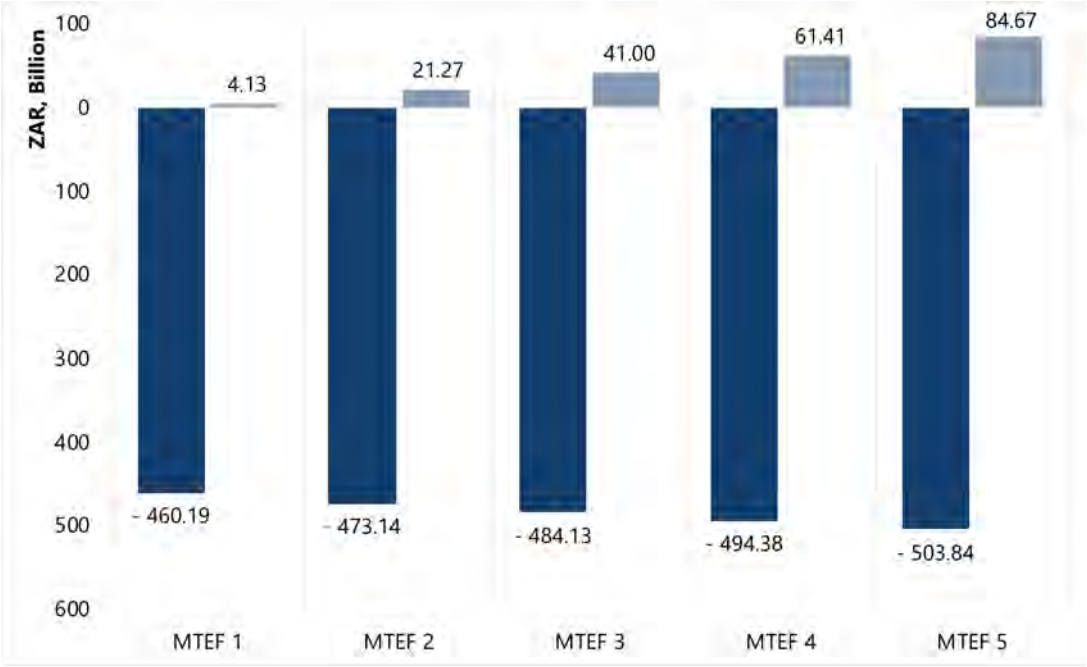


Figure ES8 Economic Value of Inaction compared to the Economic Value of Investment

Recommendations

This Investment Case provides a compelling case for scaling up a package of mental health promotion, prevention, treatment and rehabilitation interventions that yield significant returns and ultimately lead to cost savings for the South African economy. Further, this report provides a synthesis of the increasing burden imposed by mental, neurological and substance-use (MNS) disorders and quantifies the burgeoning cost of inaction. The analyses contained herein provide an explicit treatment package to be provided at each level of care to address population needs, thereby acting as a tool that the development of the NHI benefits package can draw on. We recommend that the national Treasury, Departments of Health, Social Development, Basic Education and Human Settlements collaborate to include this package in forthcoming 3-year MTEFs, for the benefit of all South Africans.

A number of key recommendations flow from this commitment:

1. Intersectoral collaboration is needed, between government departments and with NGOs.
2. Political buy-in is vital, particularly at the provincial level including Member(s) of the Executive Council(s). Head(s) of Department(s).
3. Build consensus on key issues.
4. Invest in governance structures at provincial and district level.
5. Build capacity for planning and mental health system strengthening.
6. Invest in research and information systems for mental health.
7. Improve efficiency of service delivery through the decentralisation of care and strengthened patient support structures.
8. Invest in primary care and community-based mental health services.
9. Invest in human resources for mental health and training of generalist health workers
10. Invest in infrastructure to ensure adequate quality of service provision and care closer to the community.
11. Embrace technology and innovative service delivery models.
12. Pay attention to vulnerable populations and neglected conditions, particularly among older adults.
13. Investments must target the considerable gap in service availability for child and adolescent mental health services whilst addressing their social and emotional wellbeing at a population-level
14. The role of the private sector in the mental health scale-up response must be leveraged as a critical opportunity for NHI public-private partnerships and pilot initiatives.

About the Team

The conception, methodological design, management of data acquisition, analyses and interpretation of findings have been jointly executed by Donela Besada (South Africa Medical Research Council) and Dr. Sumaiyah Docrat (University of Cape Town). Both investigators equally contributed to the drafting and preparation of this report for the National Government of South Africa. Professor Crick Lund (Kings College London and University of Cape Town) provided oversight and direction throughout this endeavour and provided critical revisions and recommendations in the finalization of this report.

Donela Besada

BSc (Hons) MPH (Epidemiology and Biostatistics), PGDip (Health Economics)

Sumaiyah Docrat

BSc (Hons) MPH (Health Economics) PhD

Crick Lund

BA Hons, MA (Religious Studies), BSocSci Hons (Psychology), MSocSci (Clinical Psychology), PhD

Acknowledgements

An effort of this magnitude could not have been completed without the help of many dedicated people. The Mental Health Investment Case Task Team is deeply grateful to the wide range of individuals who provided technical input, insightful comments, critical data access and time to enable the finalization of this momentous task. The development of the South African Mental Health Investment Case has been developed through an intensified national dialogue about investment choices and priority setting involving key National and Provincial partners, clinicians, financing experts, patient rights and community advocacy groups and prominent academics, all of whom are committed to upholding the rights of persons living with Mental, Behavioural, and Neurodevelopmental Disorders in South Africa.

The authors would like to expressly acknowledge the support received from the National Department of Health, particularly the direction and ongoing guidance received from:

- Sifiso Phakathi (former Director: Mental Health, National Department of Health: Mental Health Directorate)
- Dudu Shiba (Deputy Director, Mental Health, National Department of Health: Mental Health Directorate)
- Evah Mulutsi (Director: Forensic Mental Health, Mental Health, National Department of Health: Mental Health Directorate)
- Yogan Pillay (former Deputy Director-General, National Department of Health)

Acknowledgement and sincere appreciation are wholeheartedly given to the collaborators from the Provincial Departments of Health who were instrumental in the organization of the Provincial Multisectoral Workshops and provided their time and energy to share insights in a way that brought this work to life. The list below does not include the significant number of participants who attended the workshops, including stakeholders across the Departments of Social Development, Corrections, Education, Human Settlements and South African Police Services (SAPS), who all participated in honest and meaningful experiences, sharing narratives of their successes and challenges that together have enriched the relevance of the recommendations and priorities under consideration.

- Agnes Motlhabane (North West Department of Health)
- Brian Nzima (Eastern Cape Department of Health)
- Carol Dean (Western Cape Department of Health)
- Catherine Sibeko (Gauteng Department of Health)
- Frans Thobane (Gauteng Department of Health)
- Grace Tsele (North West Department of Health)
- Keith Ruthanum (KwaZulu-Natal Department of Health)

- Maria Mautjana (Limpopo Department of Health)
- Marinda Roelofse (Western Cape Department of Health)
- Muzi Ncobo (Mpumalanga Department of Health)
- Nkiwe Hongo (KwaZulu-Natal Department of Health)
- Nomhle Gumbo (Northern Cape Department of Health)
- Nomsa Leshoto (Free State Department of Health)
- Nonhlanhla Nkosi (Eastern Cape Department of Health)
- Ockert Erasmus (Free State Department of Health)
- Puleng Mokoena-Molepo (Limpopo Department of Health)
- Saadiq Karim (Western Cape Department of Health)
- Sarah Gumede (Mpumalanga Department of Health)
- Yvonne Magxala (Northern Cape Department of Health)

Special gratitude is further extended to Mark Blecher (Chief director: Health and Social Development, National Treasury) who generously provided insight and recommendations to improve the relevance and approach to the Investment Case modelling and cost analyses throughout its development and conceptualization.

We are very grateful to the following experts who provided critical insights, sharing their wealth of expertise and significant bodies of work to improve the assumptions and scenarios that have been included in this Investment Case, including:

- Aisha Khoele (National Treasury)
- Andre Van Rensburg (Centre for Rural Health, University of Kwazulu-Natal)
- Andrea Clarkson (Quantium Health Outcomes)
- Ashendri Naidoo (Quantium Health Outcomes)
- Awaatief Railoun (Health Facilities and Infrastructure Management Chief Directorate, National Department of Health)
- Bharti Patel (South African Federation for Mental Health: SAFMH)
- Carrie-Brooke Sumner (South African Medical Research Council)
- Goodman Sibeko (South Africa HIV Addiction Technology Transfer Centre: SA HIV ATTC)
- Inge Petersen (Centre for Rural Health, University of Kwazulu-Natal)
- Ingrid Daniels (Cape Mental Health)
- Jean-Marie Tucker (Clinton Health Access Initiative)
- Jonatan Daven (National Treasury)
- Joshila Shiba (Quantium Health Outcomes)
- Lara Fairall (Knowledge Translation Unit, University of Cape Town)
- Lauren Anderson (Knowledge Translation Unit, University of Cape Town)
- Lesley Robertson (Department of Psychiatry, Wits University & Gauteng Department of Health)
- Maddie Duncan (Occupational Therapist and Community Based Rehabilitation Specialist)
- Nxolo Madela (National Treasury)
- Peter Milligan(KwaZulu-Natal Department of Health)
- Qhama Cossie (Western Cape Department of Health)

- Selwyn September (Emergency Medical Services, Western Cape Government Health)
- Shaheem De Vries (Emergency Medical Services, Western Cape Government Health)
- Simone Honikman (Perinatal Mental Health Project, University of Cape Town)
- Soraya Seedat (Department of Psychiatry, Stellenbosch University)
- Tsietsi Matsoso (National Department of Health: Mental Health Directorate)

Additionally, we have been privileged to have had the input of leading economics and modelling experts all of whom graciously gave substantial time to guide and support the modelling and costing analyses. We therefore extend particular thanks to:

- Dan Chisholm (World Health Organization)
- Emmanuelle Daviaud (South African Medical Research Council)
- Yong Yi Lee (University of Queensland Australia)
- Rachel Sanders (Avenir Health)
- Carel Pretorius (Avenir Health)

List of Acronyms

ACT	Assertive-Community Treatment
ADHD	Attention Deficit hyperactivity disorder
AFFIRM	Africa Focus on Intervention Research for Mental health
AIDS	Acquired immunodeficiency syndrome
ALS	Advanced Life Support
APC	Adult Primary Care Guidelines
ART	Antiretroviral Treatment
ASSIST	Alcohol, Smoking and Substance Involvement Screening Test
ATTC	Addiction Technology Transfer Centre
BRICS	Brazil, Russia, India, China, and South Africa
BMH	Brief Mental Health Screening Tool
CAMH	Child and adolescent mental health services
CDC	Centres for Disease Control
CEO	Chief Executive Officer
CH	Centralized Hospital
CHW	Community Health Worker
CHAI	Clinton Health Access Initiative
CMED	Community Mental Health Education Detection
CMHS	Community-based mental health services
COE	Cost of Employment
CPD	Continuous Professional Development
CQI	Continuous Quality Improvement
DALY	Disability Adjusted Life year
DCP	Disease Control Priorities Volume on Mental Neurological and Substance-use disorders
DDG	Deputy Director-General
DFID	Department of International Development
DH	District Hospital

DHB	District Health Barometer
DHMT	District Health Mental Teams
DOH	Department of Health
DoSD	Department of Social Development
DPSA	Department of Public Service and Administration
DTA	Disorders of trauma and attachment
EC	Eastern Cape
ECD	Early Childhood Education
EFAP	Employee and family assistance programmes
EML	Essential Medicines List
EMS	Emergency Medical Services
EN	Enrolled Nurse
FPD	Foundation for Professional Development
FTE	Full time Equivalent
GBD	Global Burden of Disease
GBV	Gender Based Violence
GDP	Gross Domestic Product
HASHTAG	Health Action in Schools for a Thriving Adolescent Generation
HIV	Human immunodeficiency virus
HSRC	Human Sciences Research Council
HSRU	Health Systems Research Unit
HSS	Health System Strengthening
HST	Health Systems Trust
HTA	Health Technology Assessment
ID	Idiopathic developmental intellectual disability
ILO	International Labour Organization
ILS	Intensive Life Support
IP	Intellectual Property
IPD	Inpatient Day

ITTC	Institute for Training and Technical Cooperation
KCL	King's College London
KZN	Kwazulu-Natal
LMIC	Low-and Middle-Income Countries
MDTF	Multi-Donor Trust Fund
MHCA	Mental Health Care Act
MHIC	Mental health investment case
MhINT	Mental health INTegration
MHPF	Mental health policy framework
MNCH	Maternal, new-born and child health
MNS	Mental, behavioural, neurodevelopmental and substance-use disorders
MSF	Médecins Sans Frontiers
NCD	Non-communicable diseases
NDOH	National Department of Health
NGO	Non-governmental organization
NHC	National Health Council
NHI	National Health Insurance
NHS	National Health System
NIMART	Nurse Initiated Management of Antiretroviral Treatment
NIMH	National Institute of Mental Health
NFSB	National Injury Mortality and Surveillance System
OECD	Organisation for Economic Co-operation and Development
OPD	Outpatient Day
OR	Odds Ratio
OTA	Occupational Therapist Assistant
OT	Occupational Therapist
OTL	Outreach Team Leader
PACK	Practical Approach to Care Kit
PDE	Patient Day Equivalent

PEPFAR	The United States President's Emergency Plan for AIDS Relief
PH	Psychiatric hospital
PHC	Primary Health Care
PHQ-9	Patient Health Questionnaire-9
PMHP	Perinatal Mental Health Project
PN	Professional Nurse
PPE	Personal protective equipment
PPPs	Public Private Partnerships
PRIME	Programme for Improving Mental Health care
PSR	Post Discharge
PTSD	Post-traumatic stress disorder
QALY	Quality Adjusted Life year
QOL	Quality of Life
ROI	Return-on-investment
SA	South Africa
SADAG	South African Depression and Anxiety Group
SAFMH	South African Federation for Mental Health
SAHRC	South African Human Rights Council
SAMHSA	Substance Abuse and Mental Health Services Administration
SAMRC	South African Medical Research Council
SAPS	South Africa Police Services
SASH	South African Stress and Health Study
SBF	Services Benefit Framework
SBIRT	Screening, Brief Intervention and Referral to Treatment
SDG	Sustainable Development Goals
SEL	Social-Emotional Learning
SEYLE	Saving and Empowering Young Lives in Europe
SSRI	Selective serotonin reuptake inhibitors
STARS	Smartphone- based behavioural activation therapy

UCT	University of Cape Town
UHC	Universal Health Coverage
UK	United Kingdom
UN	United Nations
UNDP	United Nations Development Program
US	United States
USD	United States Dollar
WB	World Bank
WBOTS	Ward-Based Outreach Teams
WCGH	Western Cape
WHO	World Health Organization
ZAR	South African Rand

PART A

INTRODUCTION

1. Background

Origins

This Mental Health Investment Case for South Africa (MHIC) was commissioned by the National Department of Health (NDoH) in November 2019. It originates from dialogue and collaboration between the Task Team members and the NDoH, commencing in 2017. In 2016, the Nation came to realize the indisputable scale of devastation, loss of life and indignity imparted to the affected mental health care users (MHCUs) as a result of the Life Esidimeni tragedy [2-4]. Through the investigations of the Health Ombud, the South African Human Rights Commission (SAHRC) and the public arbitration process that has followed [2-4] a clear message was crystalized: fundamental and substantial changes to our Nation's response to the mental health and well-being of its people are urgently needed.

Despite our laudable legislative progress through the promulgation of the Mental Health Care Act 17 (MHCA) [5] of 2002 and the South African National Mental Health Policy Framework and Strategic Plan 2013–2020 (MHPF), the inquiries that followed the Life Esidimeni tragedy illustrated clearly that our implementation of these commitments have not been successful. Mental health care in South Africa is dispersed through a complex system of stakeholders. Health budgeting and broader health sector efforts towards establishing a National Health Insurance (NHI) system of financing in South Africa have not addressed the complexity of

problems our mental health system faces. Further, little technical guidance has been available to provide consistency among the different policies across sectors and to guide the development, financing and implementation of the substantive changes needed to realize the vision of accessible, equitable and comprehensive mental health care, integrated at all levels of the health system. A situational analysis for sustainable mental health financing in South Africa was conducted by members of the MHIC Task Team in 2016 [6]. Following in-depth consultations with stakeholders from the NDoH, National Treasury (NT), South African Depression and Anxiety Group (SADAG), South African Federation for Mental Health as well as a senior health financing specialist, a range of opportunities for mental health financing reforms were identified [6] as follows:

1. Focus on strategies for improving efficiency of existing financing and resources for mental health.
2. Develop an investment case for mental health to establish a mental health conditional grant for the short- to medium-term to provide a stable, ring-fenced allocation to address mental health system weaknesses to enable mental health service benefits under NHI, delivered with sufficient quality and respect for dignity.
3. Ensure the NHI benefit package includes comprehensive mental health services at all levels.
4. Ensure strategic purchasing mechanisms within the NHI Fund are incorporated for mental health to incentivize quality of care and value-for-money.

During the same year, the NDoH and South African National AIDS Council released the South African HIV and TB Investment Case (TB-HIV IC), signalling the Government's commitment to use an investment approach to inform and strengthen national efforts to end the HIV and TB epidemics in South Africa. This was in response to increasing concern that projected increases in funding for HIV and TB were unlikely to meet increasing needs [7]. The TB-HIV IC has been a powerful tool for several reasons:

1. Identified the most cost-effective mix of interventions to address HIV and TB over a 20-year time horizon.
2. Identified opportunities for maximizing existing investments by identifying what was working well and proposed strategies to leverage these actions.
3. Exposed initiatives that were not achieving value-for-money and proposed strategies to minimize these actions.
4. Demonstrated how significant investments over the medium-term could lead to significant savings in the longer-term,
5. Informed areas for change in national policy with regards to these two diseases
6. Identified evidence gaps to isolate priorities for building the evidence base.

The TB-HIV IC translated into success in numerous ways: intensifying the political will to address these epidemics and developing a vision for the future in which diverse stakeholder views were united; the apportionment

of a set of conditional grants, from the National Treasury (NT) to the NDoH thereby improving the adequacy of financing at the provincial level; and improvement of coordination and integration of components of the TB, HIV/AIDS, and Maternal, new-born and child health (MNCH) programmes to meet population health needs in an efficient manner [7]. Most importantly, these successes have led to significant increases in antiretroviral initiation, HIV testing, the accuracy and timeliness of TB diagnosis and cure rates, declines in TB treatment default and increasing life expectancy for South Africans since 2015 [8, 9]. These achievements have also been coupled with less dependence on donor funding where the program is now largely funded from South Africa's own resources.

Based on the insights of the situational analysis and recognizing the significance and value of the TB-HIV IC, the Task Team members and Mr. Sifiso Phakathi (former Director: Mental Health and Substance Abuse, NDoH) initiated dialogue regarding the development of a MHIC for South Africa. During the early stages of discussions, Ms. MP. Matsoso (former Director General – NDoH) highlighted the need for an understanding of the existing expenditure on mental health services, which had not yet been empirically quantified, as a prerequisite for the development of such a case. The MHIC was therefore conducted over two phases.

In Phase One, the NDoH commissioned a study to quantify the costs of mental health services and programmes in South Africa (December 2017). Between January 2018 and October 2019, the Task Team, in collaboration with the National and Provincial Departments of Health (Provincial Departments of Health), evaluated the health system costs of mental health services and programmes in South Africa across service levels and provinces. This research was supported by the Alan J Flisher Centre for Public Mental Health, University of Cape Town with direction and oversight from Prof. M. Freeman (former Cluster Manager: Non-communicable Diseases, NDoH), Mr. S. Phakathi and Dr Yogan Pillay (former Deputy Director-General (DDG), NDoH).

This foundational effort represented a major milestone for mental health research in South Africa, representing the first empirical assessment of expenditure on mental health services. The preliminary findings were presented to the Technical National Health Council (NHC Tech) in October 2018, where provincial Executives and Heads of Department provided feedback and support. The final report was released in October 2019 and subsequently published [10, 11].

For the first time, this nationally representative reflection of the state of mental health spending elucidated key inefficiencies and constraints emanating from existing mental health investments in South Africa. With this baseline information at hand, the government initiated a rational process to planning for system reforms; in November 2019, the NDOH commissioned a Mental Health Investment Case for South Africa,

solidifying its intentions to strengthen financing for mental health services. Although this Final Report concentrates on the Mental Health Investment Case, the full report and publication of the Phase 1 costing initiative is available as an online appendix[1].

Goals

The Mental Health Investment Case for South Africa was commissioned in November 2019 by the NDoH and supported by its Mental Health Think Tank, an advisory, voluntary, body established and chaired by the former DDG: Health, Dr Yogan Pillay. Think Tanks established by the NDoH have yielded substantial successes in enabling evidence-informed decision making and increasing funding for specific health priorities [12]. The purpose of the Mental Health Think Tank was to bring together academics, clinicians, research organizations, funders, non-governmental and civil society organizations to provide strategic guidance and review and support planning, implementation, monitoring and evaluation of mental health programming.

According to the terms of reference, the purpose of the MHIC was to determine the costs and returns of a prioritized package of system and service-level interventions. This could then inform the development of a clear national plan on the costs and benefits of investing in mental health over the next 15 years. Ultimately, the development of the MHIC is intended to support a budget bid for a conditional grant for mental health in the medium term, identifying key priorities to advance the mental health system to an acceptable level and build capacity for the Provincial Departments to address key system constraints thereby ensuring our future health system under NHI is responsive to mental health care needs.

The specific goals of the MHIC were as follows:

1. To consult with members of the Mental Health Think Tank through a Delphi study in order to obtain consensus on what core set of interventions should be prioritized for addressing the mental health burden in South Africa and achieve the goals linked to the MHPF and Human Rights Commission Report recommendations, in the short (5 years), medium (10 years) and long-term (15 years).
2. To conduct 9 multi-sectoral provincial workshops to facilitate an interactive forum for priority setting and obtaining Province-specific experiences, constraints, priorities and solutions for or mental health service delivery.
3. To calculate the total budget needed to implement the package of prioritized interventions for the South African mental health system for a short- (5 year), medium- (10 year) and long-term time horizon (20 year).

[1] Technical report: An Evaluation of the Health System Costs of Mental Health Services and Programmes in South Africa
Peer-reviewed publication: Mental health system costs, resources and constraints in South Africa: a national survey

4. To calculate the returns on these investments linked to key outcomes, which include but are not limited to: cost-savings and efficiency gains, health impacts and economic returns for a short- (5 year), medium- (10 year) and long-term time horizon (15 year).

This MHIC has been developed to provide a rational approach to new investments for mental health care for South Africa. It is designed to strengthen the country's capacity to generate and use economic evidence to scale and improve treatments for mental health.

Guiding principles

Whilst acknowledging the limitations of traditional Return-on-investment approaches, we have introduced a number of innovating methods to ensure, insofar as possible, the following principles guide the development of and recommendations emanating from this MHIC:

1. **Collective ownership** with National and Provincial Department(s), recognized as significant partners in the Investment Case process fostering greater value and applicability for South Africa.

2. Recognition of the **critical mass of expertise and experience in mental health care in South Africa** across clinical specialists, research leaders, service-user organizations, civil society and non-health Departments, whose perspectives and previous efforts should guide: analytical decisions of clinical, policy and systems interventions that are to be prioritized; parameters of mental health needs among different groups; and optimal service delivery modalities that are required to deliver the best possible outcomes.

3. **Adequate attention given to implementation-considerations and system readiness** such that recommendations and model outputs provide an honest appraisal of addressing human resource, infrastructural, governance and other programmatic constraints needed to prevent misleading estimates of returns-on-investments.

4. Commitment to make use of the **best available science and ensure data integrity** underlying economic models, making use of South African or regional evidence as a priority. Document the constraints of weak evidence and acknowledge the inclusion of interventions that have a limited evidence base may impose costs that outweigh benefits and should be avoided.

5. Acknowledgement of the **intrinsic value of improved mental health and well-being** as a worthy goal of investment. Improved mental health and well-being are not only valued by their financial impact on those affected (i.e., through their ability to contribute to the economy through improved ability to secure and be productive in the workforce).

6. Appraisal of the degree to which the country is making **optimal use of its existing resources** - pursue efficiencies and reforms in the

operational modalities of those approaches wherever possible and acknowledge the need for disinvestment of ineffective practices.

7. Improvement in the system of care should not be only guided by containment of costs or cost-effectiveness, but **balanced by moral imperatives for rights-based, quality care** as identified by the Human Rights Commission to correct historical imbalances.

8. Attentiveness to **affordability and intense budgetary and fiscal constraints** at both National and Provincial-levels and the potential impact of these constraints on the feasibility of implementation and pace at which recommendations can be adopted.

9. Pursuit of the **fundamental goal of integrated mental health care**, acknowledging that mental health care is most effective when integrated into general health care.

10. **Mental health, well-being and physical health are interconnected**; investing in mental health can accelerate progress towards universal health coverage as enshrined by our broader health policies, particularly the broader NHI and economic recovery agenda.

11. Adoption of a **recovery model** with a focus on **person-cantered care**

12. To address mental health challenges, **a life course perspective** that addresses social determinants of mental health and maximizes protective factors is essential.

Expanding our mandate

The mandate given to the MHIC Task Team has been a challenging one for a number of reasons, not least because of the complexity of the exercise, the scarcity of routine information for mental health, and the extent to which mental, neurological and substance-use disorders and Idiopathic developmental intellectual disability (ID) can require unique, highly complex and individualized responses. Further, given the range of stakeholders that have a role in addressing the mental health and well-being of the Nation, it was indeed a challenge to achieve coherence across many strongly divergent fields, perspectives and interests.

Moreover, the timing of the MHIC Task Team's work has overlapped with the passing of the NHI Bill [13], the ongoing development of the Service Benefits Framework (SBF), the drafting of the next Non-communicable Disease (NCD) National Strategic Plan, the Life Esidimeni Arbitration Award and the publication of the Report on the National Investigative Hearing into the Status of Mental Healthcare in South Africa. The need to align the MHIC with these developments was considered paramount, particularly for this initiative to be valuable. As such the Task Team has continuously expanded and reformed the approach through ongoing dialogue and feedback with key stakeholders.

Most significantly, the MHIC development has overlapped with the unprecedented COVID-19 pandemic that first gripped South Africa in March 2020. The significant shock to our health system, our country's well-being and intensifying impact on our fiscal climate is undeniable. However, as demonstrated through this report, this crisis has highlighted the critical importance of mental health for South Africa, and created an unprecedented opportunity to build back better.

The purpose of this report

The purpose of this report is to share a 15-year vision for meeting the future mental health and economic needs of South Africa, offering recommendations for how to achieve these gains in recognition of where we find ourselves as a Nation today. In this report, we conduct an analysis to estimate the expected return-on-investment (ROI) over a 15-year period from scaling up interventions targeting anxiety, depression (including perinatal depression), psychosis, bipolar disorder, epilepsy, intellectual disability, behavioural disorders, dementia, alcohol, and drug use as well as risky alcohol and substance-use. The investment case examines the costs and benefits of scaling up treatment for these conditions, and quantifies the infrastructural, human resource and programmatic requirements that should be in place for the achievement of mental health service scale-up. This MHIC draws significantly on the guidance of Global actors including the World Health Organization (WHO) the World Bank (WB) and the United Nations Development Program (UNDP).

The findings contained herein signals the need for significant new investments in the mental health system and illustrates that government, private sector, and development partners all can play a contributory role. The report provides independent, evidence-based advice that has been informed by engagement with a diverse range of stakeholders. While this MHIC is specific to South Africa, the challenges are common across the world. The fragility of mental health systems worldwide has been exposed and there are growing global calls for investment in mental health. Each country will consider the most appropriate arrangements to address the long-lasting mental health issues that will follow in the wake of the pandemic's devastation; however, in South Africa we have an opportunity to lead the global effort and place mental health at the core of our recovery efforts.

I am quite encouraged especially [as] your mandate flows from an important, important person, the DG and for me I'm quite optimistic that you have national office buy-in…that is the first part that I am optimistic about.

Multisectoral Provincial Workshop Participant, 2019-20

2.

Considering the Past and the Challenges of the Present

Burden and key drivers of mental disorders

Mental disorders make a significant and growing contribution to the burden of disease in South Africa. Latest research reports that 16% of South Africans will experience a mental illness during a given year [14] and that almost one in three South Africans (30%) will experience a mental illness during their lifetime [15].

Mental illnesses are even more prevalent among populations with comorbid health conditions. People living with HIV are at a twofold risk for depression and conversely people living with mental or substance use disorders are at increased risk of becoming HIV infected [16]. Similar bidirectional trends are observable for non-communicable diseases such as diabetes and hypertension [17]. Common mental health problems like depression, anxiety, alcohol and other substance use disorders make it difficult to adhere to life saving medications for chronic conditions and undermine treatment targets.

Importantly, the distribution of mental disorders across the lifetime and by gender is not even. Certain key developmental stages constitute higher risk for a range of mental neurological and substance use disorders [18]. Crucial vulnerable periods are in pregnancy (for perinatal depression and its negative impacts on subsequent child development) early childhood (for neurodevelopmental conditions), adolescence (for depression, anxiety, substance use and suicide), early adulthood (for psychosis) and old age (for dementias). Females are at increased risk for depression and anxiety disorders, particularly during the perinatal period and males are at increased risk for substance use disorders, suicide and conduct disorders [19].

There is now robust local and international evidence that adverse social and economic environments constitute major risk factors for mental disorders. A wide range of social determinants of mental health have been identified including demographic, economic, neighbourhood, environmental events, and social and cultural domains [19]. With the legacy of colonialism and apartheid in South Africa, our nation carries a large burden of mental health conditions as it continues to grapple with challenges of poverty, unemployment, inequality and gender-based violence – all of which are known risk factors for mental illness.

Poverty and mental illness interact in a vicious cycle whereby people living in poverty are at increased risk of mental illness, and conversely people living with mental illness are more likely to drift into poverty owing to their disability and increased health care expenditure. As a result mental illness leads to significant loss of income – approximately $3.6 billion in South Africa annually [20]. As a result, it costs South African society more to *not treat* mental illness than to treat it [20].

Existing Mental Health Resources

South Africa is fortunate to have an excellent mental health policy and legislation framework. The mental health Care Act #17 of 2002 is in keeping with World Health Organization best practice and human rights principles. The national Mental Health Policy and Strategic Plan Framework (2013-2020) is similarly aligned with WHO recommendations and was based on an extensive consultation process at national and provincial levels in 2012. These policy and legislation instruments provide guidance for the integration of mental health into Primary Health care and community care settings as well human rights protection mechanisms. The national mental health policy framework also provides guidelines for interventions to promote mental health and well-being and prevent the onset of mental illness.

However, the hope that had accompanied the new national mental health policy in 2013 has not been sustained. Implementation of the policy has been weak and very few of the targets that were set have been attained,

particularly at provincial health department level. Mental health continues to be marginalized and mental health services remain under-resourced and in a perpetual state of crisis. Latest research shows that the Department of Health spends 5% of its national health budget on mental health (provincial range: 2.1–7.7% of provincial health budgets) [14]. Most (86%) of the mental health budget is spent on inpatient care and psychiatric hospitals consume almost half of the mental health budget. There are 3.1 public sector psychiatrists per 1,000,000 uninsured population, with a critical shortage of child psychiatrists and psychologists. There are major shortages in public sector posts for psychiatrists, psychologists, mental health nurses and registered counsellors. Despite recent research which demonstrates the effectiveness of training general primary health care workers to detect, manage and refer mental health conditions, very few general health workers are equipped to deal with mental health conditions [17].

In addition to being under-resourced, mental health services are not delivered efficiently. Almost 25% of mental health inpatients are readmitted to hospital within 3 months of their previous discharge, in a revolving door pattern of care that costs the public health system an estimated $112 million annually [14]. Key areas where there are major gaps include infrastructure (particularly for community-based residential care and 72-hour observation facilities in regional and district hospitals), mental health information systems to provide routine monitoring of mental health care, transport for acute psychiatric admissions and forensic mental health services, with large backlogs in assessments and admissions.

Two recent crises have laid bare years of under-investment in mental health. First was the Life Esidimeni tragedy in Gauteng province in 2016 in which a 2000-bed facility was closed and patients with severe mental illness and intellectual disability were discharged into unlicensed and unregulated nongovernmental organizations (NGOs). This led to the death of at least 140 patients and a national outcry followed by an investigation by the Health Ombud and the Human Rights Commission. Sadly, very few of the recommendations of the Makgoba report or the report of the Human Rights Commission have been implemented.

Second, the COVID-19 crisis has increased prevalence of common mental disorders like depression, anxiety and substance use, owing to health anxiety, isolation and loss of family members [21]. In particular, the economic recession has been associated with massive unemployment, food insecurity and domestic violence, all of which have increased risk for mental health problems in affected populations. Examples include evidence of increased food insecurity and domestic violence among perinatal women [22], and increased depression. In addition, acute psychiatric admissions have increased dramatically leading to severe pressure on beds for example in the Western Cape (personal communication, Department of Health).

We always spoke the language of "we need to cost our services" ... Treasury is telling us that we're only going to receive the historical …budget. But we have never been scientific…how do we convince Treasury that what you are giving us with the historical allocation of funding…is insufficient for what the needs are

Multisectoral Provincial Workshop Participant, 2019-20

Macro fiscal climate and health sector implications

The COVID-19 pandemic has had a devastating impact on the economy. Economic losses thus far have amounted to ZAR 304 billion through reduced tax revenue with debt forecasts of ZAR 4 trillion during the 2020/21 financial year [23]; this is coupled with estimated job losses of at least 2.2 million jobs[24]. Notwithstanding the severe economic impact, the COVID-19 epidemic has resulted in a significant reallocation of resources, with ZAR 21.5 billion [25] being re-prioritised from provincial equitable shares. We are in a period of recession, with the National Treasury (NT) piloting a zero-budgeting approach, on account of increasing resource needs associated with COVID inpatient admissions, national vaccination, increased social spending (particularly on social grants), lockdown of industries that exacerbate the massive public debt and reduce investment and revenues. COVID-19 has therefore negatively impacted an already fragile fiscal climate, further limiting resources needed to support the implementation of the NHI system.

Ensuring value through health benefit package design and explicit priority setting

In light of rising healthcare demands through increases in the burden of chronic conditions, coupled with demographic transitions, the rapid development of new healthcare technology and interventions, as well as increases in population expectations of the South African health system - the gap between the demand for healthcare and country's healthcare system capacity to meet those needs (demand-supply gap) is acknowledged within the NHI White paper[26]. This is further compounded by the lack of a consistent, coordinated, and transparent mechanism for priority setting. The development of national plans must be made in explicit alignment with the resources available in the country. The well-acknowledged inequities between the country's public and private sectors, see expenditure per person of over ZAR 20,000 in the private sector, in stark contrast to that in the public sector, estimated at approximately R 5000 per person per year[27].

While NHI reforms aim to capitalize on potential efficiencies and economies of scale from the pooling of resources across the public and private sectors, contributions of medical scheme members are not available immediately to finance the NHI, with continued reservations amongst the private sector with regards to the likelihood that their benefit contributions towards the NHI will translate into equivalent service return. Furthermore, the redistribution of private healthcare expenditure through

regulation, taxation, and novel financing strategies, will contribute to increasing demand for services through the NHI. An explicit, equity informed priority setting strategy across the country's public and private sectors, embedded within fiscal constraint realities, has never been more paramount.

The ethical, political and financial challenges to priority setting are experienced across all countries, and has been explored in the literature including a landmark publication of Fuch's Who Shall Live, and its second edition published in 2011[28] exploring health economics and priority-setting in the United States (US), as well as an examination resources allocation under the National Health system (NHS) in the United Kingdom[29]. While explicit priority setting is challenging, continued approaches of implicit priority setting creates a vacuum from which rules and entitlements can be established, therefore rendering service delivery on a discretionary basis by health providers and managers within their budget envelopes. Priority setting provides the framework for which rules for allocation are explicitly stated and informed by economic analysis in order to maximize the value of investment decisions and achieve social goals[30, 31].

The country's federal fiscal system provides provincial treasuries with autonomy over the allocation of their 'equitable shares', and the discordance between national priorities and available resources at a provincial level, means that the country's public health system relies on an implicit rationing of services; those include waiting lists, unfilled staffing posts and limited facility opening hours. With the establishment of feasible national priorities, taking into consideration opportunity costs and equity, the feasibility of implementation at the provincial levels is increased, and can be coupled with accountability measures for implementation. The reliance on adopting interventions purely according to their effectiveness is not sufficient. A process needs to be established that allows for the participation of a wide-range of stakeholders and implementation of technical support systems to support priority setting and health technology assessment.

South Africa has already initiated the process of developing the services benefit framework for the country for the primary health care level. The first step of this process included a review of national clinical guidelines given its wide scope addressing the myriad of disease priorities in the country and its foundational role in the Essential Medicines List (EML) development process. The limitation of this approach is acknowledged, in that the conditions listed are facility-based and treatment oriented and need to be complimented with other community-based and prevention-service guidelines[32]. This work also served to identify care pathways from which tracking of PHC gatekeeping and referral needs could be easily achieved. The development of the services benefit package for the PHC levels gives the country its first opportunity to develop a costing database in support of the NHI. The ability to identify the discrepancy

between total estimated costs of full coverage and the current size and distribution of the country's health budget allows for a determination of the allocative efficiency of health care provision. Furthermore, potential savings through improved pricing and procurement negotiations allows for improvements in the technical efficiency of health care provision[32]. Early lessons learnt through this process include the need and benefits of stakeholder engagement in both the design and review of the benefits package as well as urgent need for national alignment across the myriad of policy, strategy, guidelines and information systems that remain incongruent[32].

The country can learn from many other settings that have formalized their process of health technology assessment, including considerations of opportunity cost and equity. Whilst defining the essential health benefit package is paramount, health system strengthening to deliver interventions needs to occur [1]. Experiences from other middle-income countries, including Mexico and Thailand, who successfully introduced mechanisms of health financing to enable rapid progress towards UHC have demonstrated improvements in health outcomes and financial protections for their populations [33]. In those settings, the reform of financing systems for health were implemented in tandem with system reforms to support quality in service delivery.

Consensus for Change

With the growing global evidence of the burden of mental health conditions, as well as evidence of cost-effective interventions, there has been a growing global movement for mental health [18]. This advocacy movement has included people with lived experience, mental health professionals, policy makers, civil society organizations, and researchers, converging on a single issue: the need to give greater priority to and investment in mental health around the world.

The Movement for Global Mental Health was launched in 2007 following the publication of the first Lancet series on global mental health [34]. Subsequently the World Health Organization launched its flagship mhGAP program in 2008 which provides guidelines for scaling up mental health services in primary care and community settings [35]. WHO mhGAP is now being utilized in over 100 countries around the world. The World Bank and WHO have committed themselves in a landmark meeting in 2016 to giving greater priority to mental health as a global health and development issue. There is increasing consensus that there can be no health without mental health and that there can be no sustainable development without mental health [18].

The focus of this global consensus for change has been on the need to scale-up investments in a broad range of proven promotion, prevention and treatment interventions for mental health [18]. In addition to their

health benefits, these interventions have been shown to yield a range of other social and economic benefits and there is now compelling evidence that investment in mental health yields a substantial return on investment: a global return-on-investment analysis has shown that for every dollar invested in mental health treatment for depression and anxiety there is a 3 to $5 return-on-investment over a 15-year period [36].

In the COVID-19 era, given the enormous impacts of the pandemic on mental health (note above), there has been renewed impetus to give greater global policy priority to mental health. COVID-19 is a unique instance where all countries (low, middle and high-income) have had the fragility of their mental health systems exposed.

In 2020 the United Nations Secretary General called on all countries to pay greater attention to mental health in response to COVID-19. WHO has provided technical assistance to countries to strengthen their mental health response to the pandemic, for example through the recent launch of WHO guidelines on Community mental healthcare [37] and guidelines for adolescent mental health promotion and prevention [38]. United for Global Mental Health, which has emerged as a strong global advocacy group for mental health has issued calls to place mental health at the core of the post pandemic economic recovery efforts and has supported the development of national mental health investment cases (https://unitedgmh.org/).

Some countries, such as New Zealand, Scotland and Iceland have created unique and far-sighted development plans that focus on Well-being as the core target for social and economic development, particularly addressing inequities in mental health and Well-being in vulnerable populations.

In tandem with these global developments there has been a burgeoning of mental health research in South Africa which has demonstrated the benefits of integrating mental health into Primary Health care and community care settings [17, 39, 40]. There is now compelling evidence on a core package of mental health services with associated screening tools and training and supervision materials which are ready to be scaled up for the benefit of all South Africans. What is needed is the commitment of new resources.

Governments need to assure themselves that investment in the mental health of their populations represents a sound and equitable investment of society's resources that leads to clear and definable health, economic, and social benefits

Dan Chisholm, PhD, World Health Organization

Chisholm D, Sweeny K, Sheehan P et al. Scaling-up treatment of depression and anxiety: a global return on investment analysis. Lancet Psychiatry.

PART B

METHODS, PROCEDURES & ASSUMPTIONS

3.
Approach & Framework

Objectives

This Investment Case has been developed to provide a rational approach to new investments for mental health care in South Africa. It is designed to strengthen the country's capacity to generate and use economic evidence to scale-up and improve treatments for mental health. In this report we conduct an analysis to estimate the expected return-on-investment (ROI) over a 15-year period from scaling up interventions targeting anxiety, depression (including perinatal depression), psychosis, bipolar disorder, epilepsy, Idiopathic developmental intellectual disability (ID), behavioural disorders, dementia and alcohol and substance-use (opioid and non-opioid) disorders. Further, we examine the ROI associated with (1) early interventions for those exhibiting risky alcohol and substance-use behaviours; and (2) social-emotional learning (SEL) programmes delivered in schools to learners (aged 12-17 years), including a specific component delivered to learners at particular risk of depression and anxiety. The investment case examines the costs and benefits of scaling up packages of interventions for these conditions, and quantifies the infrastructural, human resource and programmatic requirements that should be complementary for the achievement of mental health service scale-up. Simply put, a return-on-investment analysis comprises two components: the cost of programme implementation and the monetary value of subsequent benefits.

The Investment Case aims to inform the development of a clear national plan to reduce the substantial burden of untreated Mental, Neurological and Substance-use (MNS) disorders to reach levels of mental health that are higher than the mere absence of disease or infirmity.

Defining Mental, Neurological and Substance-use (MNS) disorders

Mental, neurological and substance-use (MNS) disorders encompass a range of conditions that are broadly characterized by the impairment of cognition, emotion and/or behaviour which is associated with distress, and disturbances in personal, familial, educational and occupational functioning [41-44]. A number of classification systems exist which categorize discrete disorders based on similar symptoms, signs and observations, including the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) and the World Health Organization (WHO) International Classification of Disease (ICD-11) [42]. The WHO defines depression, bipolar affective disorder, schizophrenia and other psychoses, dementia, intellectual disabilities and developmental disorders including autism as MNS disorders [45].

The present analysis adopts a broad definition whereby MNS disorders encompass: Alcohol-use disorders; Neurological disorders (Alzheimer's disease and other dementias, Epilepsy); Substance-use disorders (Amphetamine use disorders, Cannabis use disorders, Cocaine use disorders, Opioid use disorders, Other drug use disorders); Mood disorders (Anxiety disorders, Dysthymia, Major depressive disorder, Bipolar disorder); Psychotic disorders (Psychosis); Behavioural disorders (Attention-deficit/hyperactivity disorder, Conduct disorder); and Developmental disorders (Idiopathic developmental intellectual disability). Throughout this Investment Case, the terms MNS disorders and mental disorders are used interchangeably to refer to the abovementioned conditions. The inclusion of neurological disorders (epilepsy, dementia), developmental disorders (Idiopathic developmental intellectual disability) and substance-use disorders (herein refering to non-alcohol substances) arises because these disorders are commonly managed by mental health professionals in LMIC contexts [46]. However, in line with the recent recommendations of the Lancet Commission on global mental health and sustainable development this Investment Case also adopts the perspective that there are opportunities for intervention at all stages, from well-being to different stages of disorder, i.e. from non-specific symptoms causing intermittent mental distress to clear syndromes causing increasingly severe functional impairment [42].

Overarching Analytical Framework

The development of the South African Mental Health Investment Case has been informed by the direction of the World Health Organization (WHO) and United Nations Development Programme (UNDP) [47]. We use the WHO Inter-UN OneHealth Tool [48], developed by UN partners, along with an excel-based model, to cost clinical and rehabilitative interventions, and to project the health benefits expected from their implementation over a fifteen year period. We then estimate the total economic and social value of these health benefits. Benefit-cost ratios (return on investments) are reported separately for each intervention package. The Mental health investment case: guidance note[49] outlines six overarching methodological steps in generating a national mental health investment case, simplified in Figure 1.

Figure 1 Steps for Developing a Mental Health Investment Case adapted from [49]

Adaptations to combine rigor and relevance

Whilst the traditional core focus of the Investment Case approach seeks to identify the most cost-effective mix of interventions, it is important to highlight that the MHIC for South Africa has considered a series of arguments for investing in mental health, including those based on human rights protection, equality of access, efficiency and the consideration of the economic rationale to formulate a more robust case for investment. Further, the process undertaken has facilitated the identification of priorities across a broad range of stakeholders whilst being sensitive to the feasibility of implementation in the light of the baseline service delivery environment, the macro fiscal climate and structural changes to our health financing arrangements.

Building on the global methodological guidance, this Investment Case has introduced several methodological innovations:

1. **Collaborated with Provincial Departments of Health** to facilitate interactive, **multi-sectoral workshops** in Provinces to feed back the results of the 2018 national survey on mental health system costs, resources and constraints in South Africa and to obtain Province-specific experiences, constraints, priorities and solutions for mental health service delivery.

2. Incorporated a **broad consultation** with a panel of **multidisciplinary experts across the country** through a Delphi study in order to obtain consensus on what core set of interventions and programmatic activities should be prioritized for addressing the mental health burden in South Africa and achieve the goals linked to the Mental Health Policy Framework and Human Rights Commission Report recommendations.

3. Considered **programmatic enablers** (e.g. governance structures, training needs, interhospital transport costs) that should be in place for the achievement of mental health service scale-up in the country.

4. Considered **infrastructural and human resource** requirements associated with **residential and day-care community-based service platforms**.

5. Considered **infrastructural investments** required to establish inpatient psychiatric units at the district and regional **hospital level(s)** and infrastructure for forensic mental health services.

6. Enumerated the needs and costs of **preventative** actions including population-based **social-emotional learning programmes targeting learners in schools** and **early interventions for risky alcohol- and substance-use**.

7. Modelled the **redistribution of inpatient and outpatient care for mental health over time** in line with WHO recommendations regarding the organization of mental health service delivery channels, based on baseline distribution.

8. Quantified the costs associated with **Planned Patient Transport for Interfacility Transfers of Mental Health Care Users (MHCUs)** rendered through the Emergency Medical Service (EMS) for health system referrals.

9. Enumerated the **costs of health promotion efforts** through a radio-based mass-media campaign.

10. Considered the **unique costs that should be borne by different sectors** for mental health service delivery in alignment to their mandates and responsibilities.

4.

Setting a Course for the Future

Identifying Actions and Establishing Coherence

The selection of clinical, psychosocial, rehabilitative, preventative, programmatic, and infrastructural interventions included in this Investment Case has been informed by several overlapping processes. In addition to these interventions and actions, a service platform for community-based residential and day-care services has been developed and integrated into the investment case. The processes of achieving a shared vision for the future of mental health care and an enabling environment to support mental well-being was established through a review of National and global clinical guidelines, a structured, three phased Multidisciplinary Expert Consultation exercise; interactive, multi-sectoral Provincial workshops, and ongoing technical consultations with key experts across clinical specialties, research leaders, service-user organizations, civil society and non-health Departments, whose perspectives and previous efforts have guided many of the analytical decisions of clinical, policy and systems interventions that are prioritized; the parameters of mental health needs among different the best possible outcomes. A high-level overview of key milestones linked to the overall development of the Mental Health Investment Case is outlined in Figure 2.

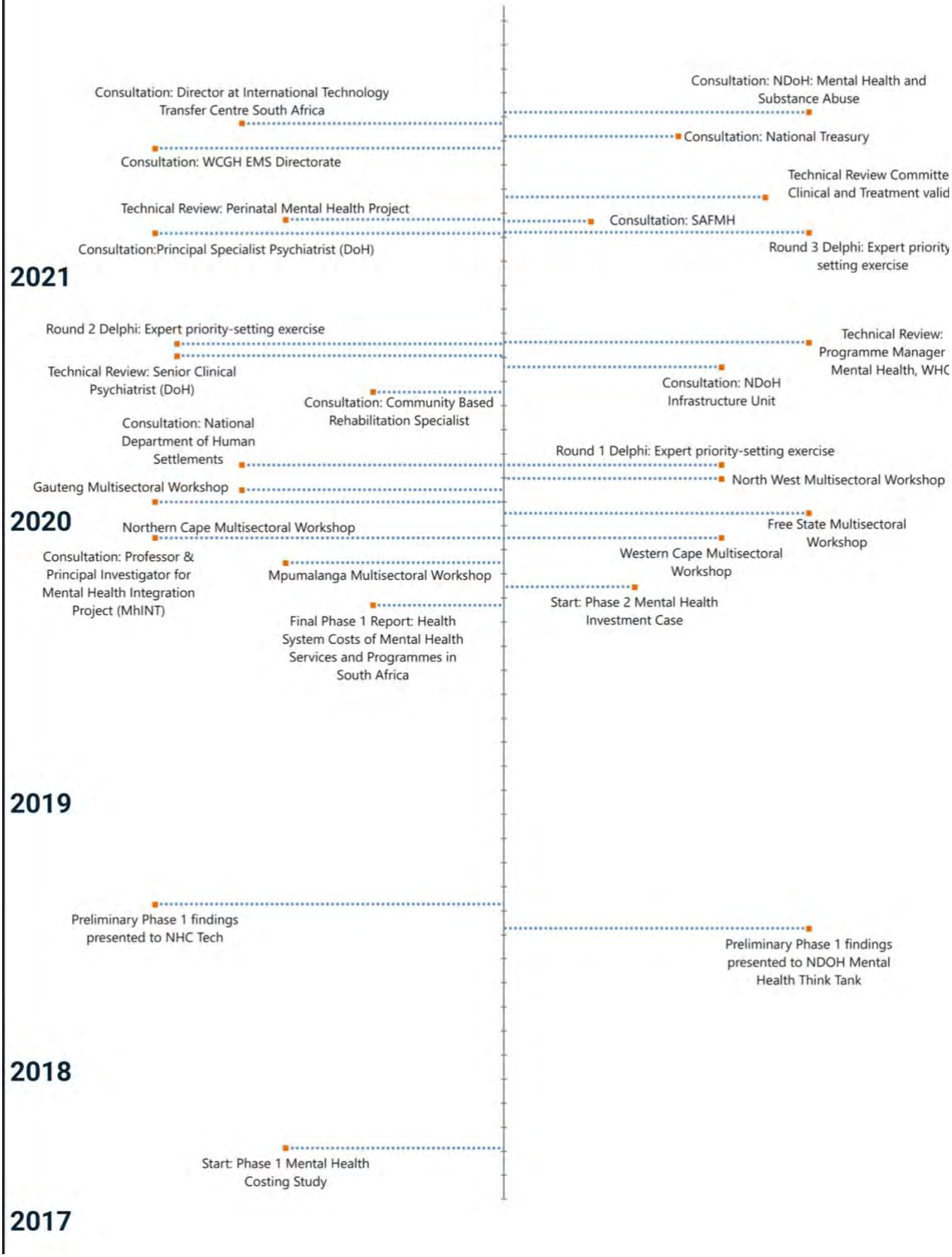


Figure 2 Timeline of Key Milestones in the Development of the Mental Health Investment Case

Clinical Interventions

Review of Clinical Guidelines

For clinical interventions, a stepped approach was applied to adapting and contextualizing global guidance for the cost-effective WHO mhGAP Intervention guidelines and priority interventions[50] identified in the Disease Control Priorities Volume on Mental Neurological and Substance-use disorders (DCP 3)[51]. These were adapted to align with the clinical protocols reflected in South Africa's Standard Treatment and Adult Primary Care (APC) Guidelines. By default, clinical treatment targeting anxiety disorders, depression (including perinatal depression), psychosis, bipolar disorder, epilepsy, idiopathic developmental intellectual disability, behavioural disorders, dementia, and alcohol- and substance-use disorders were included, once adapted in this first phase. Furthermore, in light of the significant burden of risky alcohol and substance-use in South Africa, defined as the consumption of least 60 grams or more of pure alcohol on at least one occasion in the past 30 days [52] or any drug use in the past 90 days [53], early interventions for these groups, which significantly reduce the future burden of diagnosable substance and alcohol-use disorders, at a substantially lower cost, were included.

Technical Consultations

These adapted clinical guidelines as well as medication specification, health worker time, health worker supervision inputs, baseline coverage estimation and optimal service platform recommendations were further validated and improved through periodic feedback-revision cycles from a select group of clinical specialists and implementation scientists with already adopted mental health interventions being rolled out and/or endorsed by Provincial Departments of Health. Programmatic needs associated with achieving coverage (e.g., human resource training needs), including those required at the primary health care (PHC) level to support the decentralisation of services, were sourced from experts, key Governmental (National, Provincial) consultations and review of baseline monitoring and evaluation systems and literature. Final modelled Treatment Packages and Intervention assumptions can be found in Appendix A.

Priority Setting and Systems-level Actions

Multidisciplinary Expert Consultation

To facilitate priority setting for programme areas, service-delivery and systems reforms a three-round modified Delphi study using online

questionnaires was conducted. The Delphi method is a structured process that uses a series of repeated rounds to gather information from a panel of experts. The aim of this approach is to achieve agreement among a group of experts. Each round summarises information presented in the previous round which is then presented again to stakeholders for prioritization to establish group agreement. This contributed to broader considerations beyond cost-effectiveness in our overall recommendations and aimed to identify areas of discordance and synergies between global recommendations and those of NGO, Academic and Policy stakeholders with unique experience and involvement in the South African mental health delivery landscape. In round one, 66 stakeholders identified priority areas (intervention, systems reform needs, health priorities) across twelve broad focal areas pre-identified by the Mental Health Think Tank. In round two, 47 stakeholders rated and ranked the identified interventions that emerged from thematic analysis of the round one responses across the following criteria:

- Relevance: Importance to patient populations and key strategic priorities.
- Effectiveness: Whether the evidence base has been established at the global and local levels.
- Acceptability: Whether a community or target population accepts the chosen intervention that addresses a priority problem; it also refers to the acceptability by those who will be carrying out the intervention.
- Feasibility: Likelihood of successful implementation in South Africa.

Statistical analyses of these scores were performed to establish each intervention's relative importance across each criterion. By this rationale, interventions were considered for inclusion in the Investment Case when at least 75% of panellists agreed that: the intervention was very important to patient populations or key strategic policy priorities, or there is strong evidence of effectiveness in our setting, or the community or target population is highly likely to accept the chosen intervention and those who will be carrying out the intervention will be very accepting to do so, or there is a very high likelihood of successful implementation in South Africa. If at least 75% of panellists provided a score of 8 or more for more than one criterion for a given intervention, these interventions were considered as higher priority.

In the final round, participants were invited to adjust the final included and excluded interventions by consensus from the previous round (21 participants). Final agreement of the relative priority (and priority area) was summarized based on both agreement with inclusion and/or exclusion of each intervention.

Provincial Multisectoral Workshops

Finally, we collaborated with each Provincial Department of Health to hold one-day interactive, multi-sectoral workshops in the Provinces to feedback the results of the 2018 national survey on mental health system costs,

resources and constraints in South Africa and to obtain Province-specific experiences, priorities and solutions for mental health service delivery. We use a World Café participatory method with a flexible format that can be adapted to different circumstances. Seven design principles are set out by the World Café Community Foundation, which emphasize generating an informal, hospitable, creative space, encouraging and valuing everyone's contribution and identifying insights. Issues are discussed at round café tables, with a small number of participants for a set period of time and the insights from each table are shared with the larger group. The policy café method used in this study was adapted from the World Café model.

In recognition of the multi-sectoral nature of the mental health challenge and its central role in the response, participants in each workshop comprised of purposefully selected stakeholders from the Provincial Department(s) of Health, Housing, Correctional Services, Social Development, Education, as well as the NGO community. The workshops adopted a World Café methodology which allowed participants to have collaborative dialogue, engaging actively with each other to create constructive possibilities for action. Provincial mental health coordinators or directorates coordinated participant recruitment.

Participants were mainly from the Department(s) of Health with a range of specialists, generalists and nursing staff servicing all levels of the health system, as well as district and provincial mental health coordinators and a minority of participants of from each sector, and NGO bodies. Following a series of preliminary meetings and discussions with the Provincial coordinators, venues were identified, and participants invited.

Upon consultation with the Mental Health Think Tank and in review of the findings emanating from the national costing study, the priority topic areas for the cafe-style workshops were identified. Those included the following:

1. Community-based Residential and Day Care services for Mental Disorders and Intellectual Disability including Rehabilitation and Occupational Therapy
2. Integration of Mental Health (e.g. PHC and Chronic care management; Maternal, Child and Infant Health; Emergency Services)
3. Child and Adolescent Mental Health
4. Hospital infrastructure for mental health (including 72-hour assessments)
5. Health information systems for Mental Health
6. Governance for Mental Health (Provincial and District Mental health plans, resourcing, and planning)
7. Forensic mental health
8. Mental Health Prevention/Promotion

Following a brief presentation from two of the MHIC Team members to share the feedback of the Phase One study, and to set the context for the day, participants were delegated to various tables with at least three

participants at each table. The café ran for 2.5 hours with a break halfway. Each topic was discussed generally for a period, and then each person was prompted to write down their own priorities on a shared sheet of poster paper. After the discussion of each topic, the participants from each table swapped tables to review the priorities identified by the other table and to add to them. This step of reviewing the insights and outputs of other tables is an integral part of the World Café method.

For each priority intervention area (outlined above), workshop participants collectively answered the following key questions:

- What current activities/services does your sector provide?
- What departments do you work with and how?
- What are the challenges and constraints to the current situation?
- What is working well?
- What would success look like for us?
- What role do you see your sector playing?
- What needs to be in place for us to achieve the successes described?

Table 1 Provincial Multisectoral Workshop Details

Province	Month	Venue	Participants
Mpumalanga	December, 2019	Provincial Department of Health, Nelspruit	35
Western Cape	January, 2020	SAMRC, Cape Town	20
Free State	February, 2020	Bainskloof Clinic, Bloemfontein	22
Northern Cape	February, 2020	Northern Cape College of Emergency Medical Care, Kimberley	50
Gauteng	March, 2020	Helen Joseph Hospital, Johannesburg	18
North West	March, 2020	Provincial Department of Health, Mafikeng	30

Thus far, six workshops have been conducted (Table 1), with the remaining three provinces (Eastern Cape, KwaZulu-Natal, and Limpopo) deferred due to the COVID-19 lockdown. Overall consistent themes and priorities revealed through the six workshops are summarized, with supportive quotes highlighted throughout this report. It is hoped that these workshop findings will ensure that the Investment Case will be sensitive to provincial experiences and realities.

Northern Cape

Northern Cape Delegates attend the Provincial Multisectoral Workshop for Mental Health in Kimberley, February, 2020.

Mpumalanga

Mpumalanga Multisectoral Delegates engage in the World Café Method during their Provincial Multisectoral Workshop for Mental Health in Nelspruit, December, 2019.

5.

Determining the Impact of Change

Approach to Impact Measurement

Mental Health Impacts

Health impacts of mental health interventions, measured from clinical trials and other research studies or summarized in meta-analyses, are expressed by the standardized mean effect size for outcomes including incidence, remission, case-fatality, or functioning. These effect size estimates obtained from trials are adjusted for real-world effectiveness by taking into account partial response, the lag time between the onset of the disorder and treatment, plus expected levels of non-adherence in treated populations. The effect sizes for the priority conditions and interventions used in the analyses are found in Appendix B.

Most health effects accrued through the implementation of mental health interventions relate to improvements in morbidity or disability and, to a lesser extent mortality. Health effects can therefore be measured as healthy life years gained (HLY) (equivalent to disability-adjusted life years (DALY) averted, where one DALY can be thought of as one lost year of

healthy life. Healthy life years reflect the combined time spent by the population in a particular state of health with a known degree of (or freedom from) disability. Disability levels or weights are available for all major conditions from the Global Burden of Disease initiative (Salomon et al, 2012). Implementation or scale-up of an effective intervention in the population is modelled to reduce the time spent in a disabling state, either by reducing prevalence (e.g., by decreasing the number of new cases or by increasing the rate of remission), or by improving the level of functioning of people living with the condition in question. For example, depression treatment results in a reduction in the duration of a depressive episode (equivalent to increasing the remission rate), while the management of psychosis with anti-psychotic medication and psychosocial treatment leads to enhanced management of symptoms and improved functioning in activities of daily living such as work or schooling.

The Economic Value of Improved Mental Health and Well-being

The economic and social benefits of improved mental health carry both an intrinsic value (through increased well-being) and an instrumental value (through improved capacity for individuals to undertake productive roles in society, pursue leisurely interests, learn and undertake household production roles). Both values are included in this ROI analysis. The value of a healthy life year has been estimated in the Lancet Commission on Investing in Health at 1.6 times the GDP per capita [54, 55], two-thirds of that value is attributed to labour force participation while the remaining one-third (0.5 times per capita) is attributed to the intrinsic benefit of improved health.

Lost Productivity

Losses in productivity are measured through time taken off work due to illness (absenteeism), as well as compromised job productivity whilst at the workplace (presenteeism). Local data on the lost days of productivity due to the different MNS disorders were obtained from Mall et. al [56] which determined the association between the South African Stress and Health Study (SASH) and days out of role and was complimented with data from an international synthesis of the WHO World Mental Health Surveys [57]. Compared with adults without MNS and substance use-disorders, 19 additional days out of role were estimated for alcohol and substance use-disorders, 23.4 days for bipolar disorder, and 28.2 and 27.2 additional days out of role for anxiety and depression, respectively. Data across all disorders were not available and as such, a conservative estimate of 1 working day was attributed to other disorders. Lost workdays, in conjunction with labour participation amongst the working-age population, rates of employment, and average income per worker is used to estimate these effects on the economy because of these disorders, presented as the cost of inaction. The economic costs for

children are only estimated through avoided mortality and estimates of presenteeism and absenteeism, as these populations are not in the workforce currently. Table 2 outlines the demographic and economic data that were applied in our analyses of the economic value of improved mental health and well-being.

Table 2 Demographic and Economic assumptions

Indicator	Value used	Source
Population	59,622,352	[58]
% Population aged 15-64 years	65%	[58]
GDP, ZAR	4.4 trillion	[59]
GDP per capita, ZAR	72,610.96	
GDP per employed person (average productivity, ZAR)	394,280.74	
Discount rate (for present value calculations)	3%	
Labour force, 15+ years	21,742,744	[59]
Employed labour force, 15+ years	10,980,086	
Unemployment rate, 15 – 64 years	29%*	[58]
Labour force participation rate, 15+ years	51%	[59]
Average number of days worker/year	250	
Value of a partial day out of role as proportion of a full day out of role	0.33	
Instrumental value of health (multiple of GDP per capita applied to Healthy Life Years gained)	1.1	[54, 60]
Intrinsic value of health (multiple of GDP per capita applied to Healthy Life Years gained)	0.5	[54, 60]
*It is acknowledged that current unemployment rates are currently higher, in the realm of 35%, however this rise is cyclical unemployment on account of COVID-19 is not modelled for the current investment case.		

Improvements in Labour Participation

Analyses of improvements in labour participation were predominantly focussed on improvements yielding from interventions for depression, anxiety, alcohol and substance-use disorders, risky alcohol, and risky substance-use, as well as epilepsy. The impact of the interventions targeted for the above-mentioned disorders have garnered a sufficient evidence-base with which to accurately translate increases in healthy life years, as well as avoidance of prevalent cases (through remission or averted new cases through early intervention) and mortality.

The economic value of increases in the healthy labour force due to avoided mortality were calculated by taking the total number of deaths avoided, adjusting for labour participation and employment, and then

multiplying by the annual GDP per employed person for South Africa for each year over the 15-year time horizon.

The economic value for avoided prevalent cases is estimated through increased labour force participation as well as reduced absenteeism and presenteeism. The assumption is made that 1 partial day is equivalent to a third of a whole day, translating to 1 complete day of unimpaired work per month is estimated to be restored through reduced presenteeism. Expressed as a proportion of total working days per year (250 days) and allowing for the health benefits to accrue as well as the lag time between improved health and returning to the workplace, we modelled a 5% increase in working days as a result of reduced absenteeism, and a 5% increase through reduced presenteeism in accordance to international analysis [61].

The economic value of increases in the healthy labour force due to avoided cases of illness were therefore calculated by taking the total number of prevalent cases averted, applying the same employment-related adjustments as above, and then further multiplying the result by 5% (i.e., the increase in labour force participation among those with a mental health condition who receive the treatment). The economic value of reducing absenteeism/presenteeism was estimated using the same process as above due to avoided cases of illness. The multiplication of 5% represented the decrease in absenteeism/presenteeism among those with a mental health condition who receive treatment.

Productivity gains resulting from each mental health intervention were then a sum of all the above estimates. The social value of improved health status is also calculated by estimating the healthy life years gained through the interventions, multiplying it by the GDP per capita and its intrinsic value of 0.5 (Table 2). Both values are reported.

A different method was used to estimate restored productivity for psychosis and bipolar disorder. Although the provision of lithium does have an impact on avoided cases of mortality, treatment for the above-mentioned disorders do not translate into the avoidance of prevalent cases. As such, the economic value of improved health, through the healthy life years gained, is multiplied by 1.1 times the GDP per capita, with the added social value of 0.5 times the GDP per capita attributed to the healthy life years gained.

In the case of the universal and indicated school-based prevention and promotion interventions for adolescents (12-17 years), only productivity gains due to increased labour force participation through averted future prevalent cases were estimated. Productivity gains due to reduced absenteeism and presenteeism were not estimated for the school-based interventions as these were not relevant to non-working age school students. In addition, there is currently no established methodology for

translating how impacts on educational attainment during adolescence (which can be improved by mental health prevention interventions) translates into improved job earning potential later in life.

The participation of those living with dementia, ID, conduct disorder and ADHD in the workforce is challenging to characterize, as such, only the social value of improved health, through the healthy life years gained through the scale-up of interventions are estimated for these populations Economic gains for the above-mentioned disorders, therefore, were estimated by taking the total healthy life years gained, multiplied by the GDP per capita for South Africa and then further multiplying this by a factor of 0.5 (i.e., the intrinsic value of health as a multiple of GDP per capita).

Adopting a Recovery-model

The consideration of modelled interventions and related care provision also account for the human rights considerations for increasing the quality of life of those living with MNS disorders as well as improving financial protection for this population and their household members, towards achieving the country's goals of UHC. As previously mentioned, we have adopted the principle that improvement in the system of care should not be unilaterally guided by containment of costs or cost-effectiveness, but balanced by moral imperatives for rights-based, quality care as identified by the Human Rights Commission in addition to the need to adopt a recovery model with a focus on person-cantered care. As such, for dementia, intellectual disability, bipolar disorder and psychosis, the provision of a day- and residential community-based care platform has been designed and evaluated as an additional service, despite the dearth of rigorous evaluations of the relative additional impact of these service platforms on health outcomes and quality of life performed in comparable contexts to South Africa. The provision of comprehensive community day- and residential services is intended to address the significantly long inpatient stays currently estimated for certain subsets of these populations, the alarmingly high rates of readmission due to a lack of ongoing community support as well as the complex needs for those who cannot be cared for by their households. Whilst the economic and health and broader well-being improvements for these investments have yet to be estimated for our context in South Africa, it is imperative that these services be pursued with evidence increasingly being released in higher-income settings proving the importance of such actions.

Efficiency and Cost-savings

Finally, the scale-up of mental health services whilst incorporating a gradual redistribution of hospi-centric mental health care towards the primary health and community service levels results in additional cost savings to the health sector on account of reduced needs for expensive

inpatient services. This is particularly notable in our setting, with most hospitals reporting extremely long lengths of stay for patients [62]. The average cost of treatment over time is evaluated to determine the cost-savings on account of increased decentralization of services, ensuring sufficient infrastructure for upward referrals and the gradual development of an integrated community-based service landscape to allow for discharge after acute stays with ongoing comprehensive support post-discharge.

Health Impact on other Major Disease Areas

Data limitations have restricted the ability for this Investment Case to directly model the significant benefits of investing in the mental health system that will be realized for health outcomes of other health conditions. In recognition of the significant level of comorbidity that exists between MNS disorders and other major contributors of disease burden in South Africa, namely HIV, TB, diabetes and hypertension, considerations of the health impacts of mental health service delivery on improved adherence and health outcomes among these additional conditions are discussed and reflected upon with reference to studies that have evaluated these impacts. The potential extent of comorbidities are reviewed through published studies undertaken in the South African context, drawing also from Discovery Health medical claims data obtained from Quantium Health, a data analytics firm with an established relationship with Discovery Health.

6.
Determining the Costs

In this Investment Case, we estimate the cost of scaling up coverage of selected clinical, psychosocial, rehabilitative, and school-based preventative interventions via varying delivery channels at different levels of coverage over a 15-year period. Provision of different services for patients with mild, moderate, and severe forms of each condition are considered. Further, we quantify the costs of infrastructural, human resource, governance, transport, governance, and community-based residential and day-care investments - essential for the achievement of mental health service scale-up, as agreed by expert consensus, provincial stakeholders and/or adopted policy.

All cost analyses were conducted from the provider perspective and are expressed in 2020 South African Rands, real terms, unless expressly outlined as Net Present Value estimates. In these instances, we have applied a 3% discount rate to the cost value. Total cumulative investments over the scale-up period are reported, in addition to annual appropriations for the first Medium Term Expenditure Framework period (year 1 to year 3) with estimates of annual year-on-year growth rates outlined per MTEF period over the 15-year scale-up period, and total estimated appropriations per MTEF period also outlined.

Clinical, psychosocial, and rehabilitative costs

For the primary health care level, the total cost of providing treatment is estimated through the resources used to treat patients including pharmaceutical and diagnostic needs, human resource time (in minutes) by cadre of health or social service worker, and frequency of need in a one-year period (i.e., using an ingredients based approach). The unit costs of pharmaceutical drugs are sourced from the South African Master Procurement catalogue, the unit costs of diagnostics are sourced from the National Health Laboratory Service Catalogue while health care provider and programmatic salaries are obtained from the Department of Public Service and Administration (DPSA). We assume health care providers (excluding doctors and specialists) spend 60% of their time on patient contact, with doctors and specialists assumed to spend 80% of their time on patient contact. For programmatic staff, we assume 100% of their time is spent on programmatic functions. Rural allowances have not been added given that it is as yet unknown how many health workers will be in rural areas. We have added a DPSA notch of 37% to the salaries of staff that have been costed, apart from doctors, for which their total COE includes benefits within the DPSA. Annual increases in salaries are not estimated in light of the country's decision not to increase salaries for the next medium-term.

The expected quantity of resources used is first multiplied by the unit cost of the resource, then by the number of patients who are in need of treatment (*see Populations in Need, and Coverage Assumptions, page 46*), and finally multiplied by the primary health care coverage rate for each intervention (assumed per year) in order to arrive at the total cost of scaling up coverage rates in the population at the primary health care level. A standard overhead of 12% is added to these figures to estimate the total cost of service provision at the primary health care level.

For the hospital levels (district, regional, tertiary, central, and specialized psychiatric hospitals), a normative number of assumed outpatient visits and inpatient days required for each intervention over a one-year period are multiplied by the number of patients who are in need of treatment, then by the unit cost per inpatient day or per outpatient visit, and finally multiplied by coverage rates for each intervention (assumed per year) in order to arrive at the total cost per year over time. Unit costs per inpatient days at public hospitals are based on the Health Systems Trust District Health Barometer (HST-DHB) (12th Edition – 2016/17) datafile [63] which provides hospital-level indicators of public expenditure per patient day equivalent (PDE) for all categories of public sector hospitals. All costs were inflated to real 2020 prices, at an annual inflation rate of 4.8%. Provincial estimates for expenditure per PDE were weighted based on useable beds available for each level of care. All inpatient and outpatient costs for all hospital levels were estimated using the unit costs for a psychiatric

hospital, in recognizing that this platform represents an accurate reflection of costs for mental health units, with higher costs for other hospital levels, on account of the expanded surgical and treatment services that would not be appropriate for our modelled population. Outpatient unit costs at the hospital level are calculated as one-third the cost per PDE for inpatients for each level of care. This calculation assumes that the resources required to treat one outpatient represent one-third of the resources for treating a single inpatient.

To account for a gradual and rational redistribution in service delivery over time, inpatient and outpatient services in the base year were assumed to be distributed in line with the baseline service delivery channels determined by the formative costing study [62]. For each year of the scale-up period, increased service provision for outpatient services was modelled for the primary health care level to a maximum of 80% for most disorders, except for alcohol- and substance-use disorder withdrawal and prevention services, provided for at the hospital levels. Coverage changes at the hospital levels are decreased gradually over time, as increased service provision at the PHC level takes place, and programmatic investments in training and other enablers are put in place. Whilst outlined in detail in the following paragraphs, the baseline and target service distributions for outpatient and inpatient care are specified in Appendix C.

For each year of the scale-up period, increased service provision for acute inpatient stays was applied equally at the district and regional hospitals, in alignment with the recommendations of our technical review panel, whilst longer-term stays were distributed across the higher levels of care; capped at the maximum hospital capacity currently existing in South Africa. The following distributions (below) reflect the proportion of total Inpatient Days (IPDs) that would be provided for at each level of care by the scale-up period. IPD needs are calculated according to the average number of IPDs per person and the respective coverage of treatment; distributions for hospital levels are therefore determined according to the relative contribution of acute and long term stays for each disorder. For example, the average length of stay for patients treated for bipolar disorder and psychosis is 13.2 (15% estimated to require 28 inpatient days, and 10% requiring 90 inpatient stays). As such, for acute stays, the district and hospital targets amount to 16%. As a result, the relative attribution of those inpatient days towards long term stays at higher levels of care will inevitably be larger, with service distribution towards the tertiary and centralized hospitals not exceeding the current hospital availability for each level of care in the country. According to the 2019 District Health Barometer, the country reports 252 District hospitals; 48 regional hospitals; 19 tertiary hospitals; and 9 centralised hospitals and 24 Specialized Psychiatric hospitals [64].

Community-based Residential- and Day-care service platform costs

In addition to the costs associated with scaling up coverage of selected clinical, psychosocial, and rehabilitative interventions, we quantify the costs of an integrated service platform for community-based residential- and day-care services. For community-based residential- and day-care services, a combined approach to costing has been applied. Assumptions for the proportion of patients requiring residential and day-care services are obtained from WHO recommendations [65] and complimented with engagement with our technical review panel. Needs for these services across modelled disorders are summarized in the technical appendices.

For residential care, an ingredients approach to costing is applied for human resource time (in minutes) by cadre for normative assumptions regarding needed rehabilitation support, including a full-time facility manager and treatment support through monthly visits by a professional nurse in a one-year period. Medication costs are subsumed within the cost of treatment modelled for these conditions. The expected quantity of resources used is first multiplied by the unit cost of the resource, then multiplied by the community residential care coverage rate and population in need for each intervention (assumed per year) in order to arrive at the total cost of scaling up coverage rates in the population at the community based residential care level. FTE needs for all staff providing care are estimated. A per diem "accommodation" unit cost is then added for each resident receiving care per year, calculated as the monthly subsidy paid by each province for the different categories of mental health care users divided by 30 days, then multiplied by the length of stay. For community residential care, patient length of stay is assumed as 365 days.

A similar approach was applied for day-care services whereby human resource time (in minutes) by cadre for a rehabilitation service are estimated. Once again, medication-related costs are attributed to the primary health care level. Needs are therefore calculated based on the assumed frequency of need per mental health care user (by condition) in a one-year period. The expected quantity of resources used is first multiplied by the unit cost of the resource, then multiplied by the day-care coverage rate and population in need for each intervention (assumed per year) in order to arrive at the total cost of scaling up coverage rates in the population for day-care services. A per diem "overhead" unit cost is then added for each day-care client receiving care per year, calculated as the monthly day-care subsidy paid by each province for the different categories of mental health care users divided by 20 days, then multiplied by the frequency of days attended. For day-care, 100 days per year per person in need is assumed.

Costing Social-emotional learning (SEL) programmes targeting learners in schools

According to the DCP [66], the cost of implementing school-based SEL interventions for LMICs has not been well established, however summary costs obtained from implementation experiences in Ethiopia, India, Mauritius, and Mexico using methods that have been developed for micro-costing of population-based alcohol control strategies are drawn on. The analysis used data for psychosocial interventions addressing depression amongst adolescents aged 12-16 years in Mauritius, known as the Resourceful Adolescent Programme–Adolescent version (RAP-A), which demonstrated that 11 hourly psychosocial sessions translated to short-term benefits to depression, hopelessness, coping skills, and self-esteem; benefits to coping skills and self-esteem were sustained after a 6 month follow up period. The DCP costed the intervention by applying the programme only to 12-year-olds in the population, estimated to make up 0.8%-1.4% of their total population.

Intervention facilitators are assumed to work full-time on this programme, and rotate across different schools or districts, and are able to provide up to 6 sessions per day; training costs will be higher should these facilitators be part-time on the programme. A set of 20 health educators are provided with one supervisor; with central administration and program management costs also considered. Based on an assumption of 220 school days per year and 20 students per session, 1.7–2.8 full-time health educators are required to deliver the intervention at scale for a district with a population of one million. The full cost of implementing this programme at scale, assuming 100% coverage would therefore range from US$0.03 per learner in Ethiopia and India to US$0.11 in Mexico and US$0.24 in Mauritius; these varied costs are on account of the higher salary and other input costs. Overall, however, the findings indicate that school-based SEL interventions represent a low-cost strategy for promoting adolescent mental health.

The costs associated with the two Socio-emotional learning (SEL) programmes targeting learners, aged 12 to 17 years, included in this analysis was undertaken using a model developed by consultants commissioned by the WHO. As a result of making use of an external model, certain parameter adjustments to better reflect the local South African context were limited, in part, when compared to the broader cost assessments conduced within this Investment Case. In this model, costs were obtained through a meta-analysis [67] undertaken by the University of Stellenbosch, which estimated the provision of universal-SEL programmes (i.e. to all learners aged 12-17 years). A total of 18 hours (range: 18 - 24) was enumerated to train intervention facilitators who then deliver the interventions in classrooms with an estimated 11 hours (range: 6 - 20) of total contact time spent with learners. The second SEL programme modelled, referred to as the indicated-SEL intervention,

specifically targets learners (12-17 years) with sub-threshold depression symptoms. This requires additional resources to screen students for sub-threshold depression symptoms using mental health symptom checklists. The Indicated-SEL intervention requires (1) teachers supervising screening in class for 30 mins, and (2) teachers scoring mental health symptom scales taking an estimated 10 minutes per student. The intervention duration was estimated to require a total of 10 hours (range: 3.5 - 18) of total contact time with learners. These preliminary analyses assume that the intervention cost would be similar to a previously costed alcohol harm-reduction intervention involving the provision of individualised counselling to heavy alcohol consumers (the analysts note that this would likely be an overestimate as school-based interventions are group-based).

Based on data from the Department of Basic Education, we applied an average of 31 learners per teacher for both interventions. Full details regarding the resource inputs and assumptions for the SEL programmes (including staffing and time dedicated to the development and initiation of the programmes prior to roll-out) are discussed in detail in *PART D* of this Report: *Achieving a Sustained and Integrated response*. It is important to note that the analysis in this report provides the intervention to *all* learners between the age of 12 and 17 years. Full time equivalent needs are presented independently for our analyses.

Programmatic and Health Systems Costs

In this Investment Case, we account for broader programmatic and health system strengthening costs and capital needs to support the delivery of interventions, and their uptake by individuals. Within this category, we enumerate the investments needed for capital infrastructure, governance structures, planned interfacility patient transport, primary health care provider training and supervision mechanisms and health promotion efforts - as agreed by expert consensus, provincial or National stakeholders' consultations, the recommendations of the Human Rights Commission, and/or adopted policy.

Further details related to the approach taken to costing each of these health system and programmatic actions are outlined in *PART D* of this Report: *Achieving a Sustained and Integrated response*, given that the costing approach and needs associated with these actions were determined through the modelling exercise and/or through recommendations of experts via the consultation forums which formed part of the overall methodology of this Investment Case.

7.

Determining the Return-on-investment

This return-on-investment analysis quantifies the cost of scaling up mental health service provision in South Africa over a 15-year period from current coverage levels and estimates the monetary value of subsequent benefits. Key input parameters for these analyses cover demographic, epidemiological, effectiveness and economic domains.

The return-on-investment for each intervention was calculated by comparing the productivity gains produced by the intervention (measured as an increase in GDP) with the total costs of setting up and implementing the intervention. Projected costs and projected productivity gains were estimated using the net present value (NPV) approach with a 3% annual discount rate. The monetary value of health impacts (healthy life-years gained) and economic outcomes (productivity gains) of scaled-up investment in mental health are related to the costs of intervention by obtaining a ratio of benefits to costs (benefit-cost ratio). On account of the estimated costs and benefits changing from year to year, the return-on-investment will also vary over the scale-up period. For example. initial programme costs might be high in relation to realized benefits in the early years of scale-up but will become comparatively lower as benefits begin to accrue, and start-up costs are no longer needed. This is reflected in the presentation of these estimates for various periods of the 15-year scale-up. Separate ratios are presented to account for the benefits due to

increased productivity alone, as well as the combined benefits due to both productivity gains and the social value of health and improved well-being. These are also reported separately for each intervention package. The formulae underlying the calculation of these ratios is specified in Figure 3.

$$\text{Benefit-cost ratio} = \frac{(\text{Value of Increased well-being} + \text{Value of Increased productivity})}{\text{Intervention Costs}}$$

Figure 3: Benefit-Cost Ratio Calculation Formulae

As detailed in the preceding sections of this report, the calculation of the monetized present value of both increased well-being (social value) and increased economic productivity, used to generate the benefit-to-cost ratios which convey the returns-on-investment, rely on prevailing estimates of GDP, Labour force participation and unemployment. Notwithstanding the severe economic impacts of COVID-19, through massive public debt accumulation, reduced revenues as a result of the lockdown of industries and significant job losses; South Africa's fiscal climate has been characterized as fragile for the past several years with and low economic growth projections having been forecasted in 2017 to last until at least 2020 [68]. Compared to comparable middle-income settings, our labour force participation and unemployment rates are also notably high.

Given the long-term time horizon of this analysis, we have conducted a sensitivity analysis on all benefit-cost ratios, where the valuation of benefits (both social value and economic productivity returns) account for a 1.6% annual growth in GDP starting from the second year of the 15-year scale-up period. Notably, population growth increases by 1.2% annually, meaning that the relative GDP increase can be conservatively thought of as 0.4% year-on-year. In addition, consistent with the Investment Case approach applied in other settings, this sensitivity analysis also broadens the valuation of benefits beyond the social value of improved health and value of economic productivity, to include the net present value of avoided health care expenditures. The number of cases who *would have* needed services (i.e., the number of prevalent cases averted per year) is multiplied by the average cost of treatment per year, for each applicable condition and discounted to reflect a present value estimate. Together, the present value of the social, economic and health savings are then divided by the present value of the total financial costs of service investments to enumerate benefit-to-cost ratios that account for health care savings and modest GDP growth that will accrue over the 15-year period.

8.

Populations in Need, and Coverage Assumptions

Prevalence

The current and projected number of people living with Mental, behavioural, neurodevelopmental, and substance-use disorders, prioritized for the provision of treatment and rehabilitative health interventions in this investment case is outlined in Table 3. These conditions include anxiety disorders, depression, (including moderate-severe depression and anxiety among children between 10 and 15 years), peri-natal depression, psychosis, bipolar disorder, epilepsy, intellectual disability, behavioural disorders (conduct, ADHD), dementia, alcohol, and substance-use (opioid and non-opioid) disorders. These figures reflect the best available evidence on the prevalence rate of these conditions in our country and have been applied to the current and projected South African population, accounting for incidence, expected mortality and spontaneous remission in the absence of treatment. For the purpose of this ROI analysis, these estimates reflect the total population(s) that are potentially in need of treatment. Note that the provision of health care for children with moderate-severe anxiety and depression has been included, whilst universal and indicated school-based interventions for all South African learners, as well as those with sub-threshold depression and

anxiety symptoms, are addressed separately through non-health (school-based) interventions (Table 6).

Table 3 Number of People living with a priority Mental, Neurological, Neurodevelopmental or Alcohol and Substance-use Disorder in South Africa (accounting for remission and deaths)

Disorder/Condition	Prevalence Rate [69]	Base Year	15-year
Anxiety disorders (All ages)	3.83%	2,249,227	2,558,507
Moderate-Severe Anxiety among Children (10-14 years)	3.24%	162,689	163,717
Depression (All ages)	4.21%	1,543,277	1,724,023
Moderate-Severe Depression among Children (10-14 years)	0.82%	34,730	35,165
Perinatal depression (15 – 49 years)	20.00%	190,908	174,215
Psychosis (15+ years)	0.23%	131,251	154,707
Bipolar disorder (15+ years)	0.57%	294,861	345,286
Epilepsy (1+ years)	0.44%	260,637	292,364
Idiopathic developmental intellectual disability (1+ years)	0.33%	192,540	208,914
Conduct disorder (5-19 years)	0.64%	1,353,548	2,019,665
ADHD (5-19 years)	0.61%	329,529	360,051
Dementia (40+ years)	0.35%	237,543	331,889
Alcohol use disorder (15+ years)	1.94%	1,367,140	1,627,932
Substance-use disorders (15+ years)	2.00%	699,207	834,177
Opioid	0.80%	260,331	295,342
Non-opioid	1.20%	438,876	538,835
Total		9,746,294	11,664,789

It is important to highlight that the prevalence rates applied to the South African population in this study are highly conservative and have been derived through modelling exercises led by the Global Burden of Disease Initiative. These estimates are known to be unreliable, despite the methodological rigour in modelling approaches. Ultimately, the quality of these estimates relies on the quality and availability of the data sources that are fed into the modelling process for the country-level. In South Africa, the last population-based study of the prevalence of mental disorders in the country was conducted in 2002/3 – speaking to the large number of assumptions that are applied in generating up-to-date estimates, most of which are do not adjusted for our local context.

Acknowledging the limitations inherent in making use of data that reports only on the minority of insured people in the South African population, it

is noteworthy that the prevalence of Depression and Anxiety disorders (alone), quantified for Discovery Medical Scheme members as at the end of 2019 (Table 4), are 10% and 3% higher than the prevalence rates reported by the GBD study for 2019 for depression and anxiety disorders, respectively. Further, between 2018 and 2020 (i.e. a two year period alone), the prevalence of depression and anxiety increased by 1.6% and 1.0%, respectively, among Discovery Health members. Notwithstanding the expected impacts of the COVID-19 pandemic on the mental Well-being of the country; the need for a national, population-based prevalence study for Mental, Neurological, Neurodevelopmental and Substance-use Disorders is urgently needed to inform appropriate planning.

Table 4 Private Sector Comparisons for Depression and Anxiety (Discovery Health)

	Depression	Anxiety
Prevalence Rates (2019)		
Discovery Health Member 15+ years	14.21%	6.76%
Modelled Population Burden (GBD)	4.21%	3.83%
Difference	10.01%	2.93%
Increase in Prevalence among Discovery Health members, 15+ years (2018-2020)		
2018	13.36%	6.28%
2020	14.93%	7.29%
Difference	1.57%	1.01%

In addition to targeted and intensive interventions for those with diagnosable alcohol and drug-use disorders (as reflected in Table 3), this Investment Case has modelled interventions that target the significant burden of people who consume alcohol and other substances at levels that are considered risky. Early interventions for these groups can significantly reduce the future burden of substance and alcohol-use disorders, at a significantly lower cost. Table 5 outlines the current and projected prevalence of risky alcohol use and risky substance-use. Risky alcohol use has been defined as the consumption of least 60 grams or more of pure alcohol on at least one occasion in the past 30 days [52], whilst risky substance-use has been defined as any drug use in the past 90 days assessed using the seven item 'Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) [53]. These estimates are modelled to reflect the population(s) in need of early interventions.

Table 5 Estimated Number of People meeting the criteria of Risky Alcohol or Substance use in South Africa [53, 70] (accounting for remission and deaths)

Disorder/Condition	Prevalence Rate Used	Base Year	15-year

Risky Alcohol use (15+ years)		18.30%	7,714,473	8,194,431
Risky Substance use (15+ years)		8.60%	3,623,326	4,207,061
	Total	26.90%	11,337,799	12,401,492

In addition to the provision of health care interventions for children (10-14 years) with diagnosable moderate-severe anxiety and depression (prevalence and estimated cases outlined in Table 3); this investment case also models the implementation and gradual scale-up of a universal, school-based, social and emotional learning (SEL) intervention for all South African learners, as well as a more intensive school-based SEL intervention for learners identified with sub-threshold depression and anxiety symptoms. The school attendance rate, estimated at 98%, was applied to identify the number of learners aged 12-17 years in need of each intervention with 5% of these learners estimated to have sub-threshold anxiety and depression (Table 6).

Table 6 Number of School Learners (12-17 years) targeted for universal and indicated school-based social and emotional learning interventions

School-based social and emotional learning intervention	Total Number of Learners targeted (12-17 years)
Universal, school-based, social and emotional learning (SEL) interventions for 12-17 years	6,251,601
Indicated, school-based, social and emotional learning (SEL) intervention	312,580

Responding to the Forensic mental health service needs in South Africa, Table 7 outlines the current and projected forensic caseload for the country. These estimates serve as the population in need of forensic mental health services and have been supplied directly from the National Department of Health.

Table 7 Forensic Mental Health Caseload

	Base Year	15-year
Forensic Cases	4,500	5,221

Baseline and target coverage of interventions and services

Appendix D outlines the proportions of the target populations that are estimated to need or be able to access each of the modelled intervention packages (packages are detailed in full in Appendix A). Baseline (i.e. year 1 of the 15-year scale-up period) and target coverage rates (as at the end of the 15-year period) are listed as modelled in this Investment Case

analysis. Baseline coverage estimates were assumed based on the best available evidence and engagement with service experts in the country; baseline treatment gaps are estimated to be at least 91%, with assumed higher coverage rates for severe MNS conditions. Modest target coverages were applied across disorders in the recognition of the significant treatment gap that currently exists. A range of treatment interventions for alcohol relapse prevention and opioid and non-opioid withdrawal are also modelled; medication for these interventions currently don't exist in South Africa, therefore baseline coverage is 0.

The provision of community-based residential and day-care services have been modelled for a subset of people living with psychosis, bipolar disorder, dementia, and idiopathic developmental intellectual disability (ID). The proportions of those requiring these community services (also detailed in Appendix D) were identified based on WHO recommendations and further adapted through technical consultations with local experts in South Africa. Whilst no universal recommendations exist for the specific needs within each sub-populations, we relied exclusively on technical expert recommendations.

It is acknowledged that global recommendations call for day-care services for those living with drug-use disorder, conduct disorder, and children with emotional problems. However, it is anticipated that these needs may be addressed through services at the primary health care level, including family psychoeducation both for ADHD and conduct disorder; school-based interventions; comprehensive treatment and rehabilitation support for drug use/dependence, and early interventions for risky substance use modelled in this analysis. Residential services for ID are modelled for 20% of those assumed to be living with moderate-profound Idiopathic intellectual disability, assumed to be 18% of the total population living with ID [71].

PART C

COSTS OF SCALE-UP, HEALTH IMPACTS, RETURNS-ON-INVESTMENT & THE PRICE OF INACTION

9.

Cost and Needs Assessment

Number of Person(s) Reached

Treatment and Rehabilitation

Table 8 outlines the total people reached through the scaling-up treatment and rehabilitative interventions from current to target levels of coverage over the 15-year period. This scale-up is expected to result in a 5.3-fold increase in the number of persons in need who receive care, on average, from an estimated 731,872 cases reached to 3,885,596 cases reached by the 15-year milestone. Note that the provision of health care for children with moderate-severe anxiety and depression has been included, whilst universal and indicated school-based interventions for all South African learners, as well as those with sub-threshold depression and anxiety symptoms, are addressed separately through non-health (school-based) interventions (Table 10)

Table 8 Persons reached through Treatment and Rehabilitative Interventions over 15-year scale-up

Disorder/Condition	Base	3-year	6-year	9-year	12-year	15-year	Change
ADHD, 5-19 years	21,224	37,084	61,631	87,058	113,200	139,827	6.6
Alcohol use disorder, 15+ years	67,315	140,342	255,804	378,705	508,653	644,988	9.6
Anxiety disorders, 15+	210,942	294,711	426,747	564,340	706,386	851,887	4.0

Disorder/Condition	Base	3-year	6-year	9-year	12-year	15-year	Change
years							
Moderate-Severe Anxiety among Children, 10-14 years	3,661	5,295	7,653	9,919	12,433	14,735	4.0
Bipolar disorder, 15+ years	73,054	93,726	126,955	140,219	171,420	204,335	2.8
Conduct disorder, 5-19 years	65,137	120,367	215,938	326,863	452,338	592,260	9.1
Dementia, 40+ years	13,999	20,693	32,410	45,558	60,562	77,686	5.5
Depression, 15+ years	109,705	168,325	261,336	359,523	462,311	568,337	5.2
Moderate-Severe Depression among Children, 10-14 years	313	543	884	1,205	1,568	1,899	6.1
Epilepsy, 1+ years	102,862	120,812	148,669	176,843	205,045	233,009	2.3
Idiopathic developmental intellectual disability, 1+ years	19,146	33,254	55,326	77,978	101,198	124,858	6.5
Perinatal depression, 15 – 49 years	12,160	34,401	65,547	95,848	127,233	159,188	13.1
Psychosis, 15+ years	32,355	41,909	57,058	73,038	89,815	107,299	3.3
Substance-use disorder, 15+ years		20,904	53,427	88,513	125,986	165,289	15.5
Total	731,872	1,132,366	1,769,386	2,425,610	3,138,148	3,885,596	

Early Interventions for Risky Alcohol and Substance-use

In addition, the scaling up of brief interventions for persons identified with risky and harmful alcohol and substance-use translates into an almost 6.6-fold increase in those receiving early intervention, from a baseline estimate of 562,806 people to an estimated 3,700,466 people over the scale-up period. (Table 9).

Table 9 Persons reached through Early Interventions for Risky Alcohol and Substance-use over 15-year scale-up

Disorder/Condition	Base	3-year	6-year	9-year	12-year	15-year	Change
Risky Alcohol use, 15+ years	384,114	665,679	1,099,069	1,539,368	1,989,006	2,448,830	6.4
Risky Substance use, 15+ years	178,692	315,302	531,997	760,791	1,001,235	1,251,636	7.0
Total	562,806	980,981	1,631,066	2,300,159	2,990,241	3,700,466	6.6

Population-level School Based Interventions

The development, implementation and scale-up of social-emotional learning programmes for school-going children (12-17 years) translate into an almost two-fold increase in learners between the 3rd (i.e. the first year of implementation) and the 15th year milestone (Table 10). By the end of the scale-up period, a total of 5,973,406 learners are estimated to have been reached, 4.8% of which are likely to have sub-threshold depression symptoms. The first two years of the scale-up period are

dedicated to the planning and development of the programme, and as such, no learners are reached until year three. From the third year, partial implementation is reached, in which 5% of schools are covered and with ongoing scale-up, 91% of schools are reached by the end of the scale-up period.

Table 10 Learners reached through social and emotional learning (SEL) interventions in schools over 15-year scale-up

Learner Interventions	Base	3-year	6-year	9-year	12-year	15-year	Change
Indicated, school-based, social and emotional learning (SEL) interventions	-	156,290	188,330	220,369	252,408	284,448	1.8
Universal, school-based, social and emotional learning (SEL) interventions	-	3,125,801	3,766,590	4,407,379	5,048,168	5,688,958	1.8

Forensic Mental Health

Annual forensic cases are estimated to remain consistent, increasing only by average population growth, over the 15-year scale-up period. The analysis estimates that all forensic cases are provided with the required assessments and/or state services each year (Table 11).

Table 11 Forensic Mental Health Cases Reached (Base -15 year scale-up)

Forensic Services	Base	3-year	6-year	9-year	12-year	15-year
Forensic Cases	4,500	4,609	4,759	4,902	5,041	5,176

Costs of Service Scale-up

The costs of scale-up are presented separately for treatment and rehabilitative interventions, those addressing risky alcohol and substance-use, those for social and emotional learning programmes in schools as well as for forensic services. Total cumulative investments over the scale-up period are reported, in addition to annual appropriations for the first Medium Term Expenditure Framework (MTEF) period (year one to year three) with estimates of annual year-on-year growth rates outlined per MTEF period over the 15-year scale-up period, and total estimated appropriations per MTEF period also provided.

Treatment and Rehabilitation

Table 12 outlines the costs of services for Treatment and Rehabilitation Interventions for the first MTEF period, as well as the average Year-on-Year increase for all 3-year MTEF periods taking place over the 15-year scale-up period. Treatment and rehabilitation interventions for the target populations as detailed in the technical appendices of this Report, demonstrate that the average annual cost increases are largest for the first

Table 12 Medium Term Estimates of Annual Appropriations for Treatment and Rehabilitative Interventions and Average Year-on-Year increases per MTEF period over 15-year scale-up

	Medium Term Estimates Annual Appropriations, ZAR, million			Average Annual Year-on-Year Growth Rate per MTEF period over 15-year scale-up, %				
Target Population	**Year 1**	**Year 2**	**Year 3**	**Year 1-3**	**Year 4-6**	**Year 7-9**	**Year 10-12**	**Year 12-15**
ADHD, 5-19 years	64.78	85.74	106.40	28.2%	16.0%	10.5%	7.6%	5.8%
Alcohol use disorder, 15+ years	273.44	406.15	539.53	40.7%	21.3%	13.6%	10.1%	8.1%
Anxiety disorders, 15+ years	421.85	498.95	576.95	17.0%	12.0%	8.7%	6.7%	5.3%
Moderate-Severe Anxiety among Children, 10-14 years	11.41	13.79	16.07	18.7%	11.9%	8.0%	6.9%	4.9%
Bipolar disorder, 15+ years	2,888.73	3,284.14	3,696.10	13.1%	10.6%	3.0%	6.9%	6.0%
Conduct disorder, 5-19 years	185.24	258.20	334.44	34.5%	20.1%	13.4%	10.0%	7.9%
Dementia, 40+ years	124.93	154.42	184.60	21.6%	16.1%	12.0%	9.9%	8.6%
Depression, 15+ years	300.16	394.86	489.77	27.8%	16.7%	11.2%	8.3%	6.5%
Moderate-Severe Depression among Children, 10-14 years	0.97	1.32	1.65	30.2%	16.4%	9.9%	8.2%	5.7%
Epilepsy, 1+ years	200.78	217.89	235.50	8.3%	7.1%	5.9%	5.0%	4.3%
Idiopathic developmental intellectual disability, 1+ years	88.92	112.33	134.67	23.1%	13.9%	9.7%	7.2%	5.8%
Perinatal depression, 15 – 49 years	40.98	71.51	100.38	57.4%	21.5%	12.2%	8.9%	6.9%
Psychosis, 15+ years	1,223.79	1,395.58	1,575.26	13.5%	10.7%	8.5%	7.1%	6.1%
Substance-use disorder, 15+ years	0.00	617.32	1,213.06	96.5%	37.1%	18.3%	12.5%	9.5%
Total	**5,825.98**	**7,512.19**	**9,204.36**					

Table 13 Total Investment in Treatment and Rehabilitative Interventions per MTEF period over 15-year Scale-up, ZAR million

	Medium Term Appropriation Estimates per MTEF period over 15-year scale-up ZAR, million, % of 15-year total					Cumulative 15-year Investment ZAR, million
Target Population	**Year 1-3**	**Year 4-6**	**Year 7-9**	**Year 10-12**	**Year 12-15**	
ADHD, 5-19 years	256.92	438.97	614.06	782.54	941.18	3,033.66
	8.5%	14.5%	20.2%	25.8%	31%	
Alcohol use disorder, 15+ years	1,219.12	2,455.58	3,772.60	5,168.60	6,636.53	19,252.43
	6.3%	12.8%	19.6%	26.8%	34%	
Anxiety disorders, 15+ years	1,497.74	2,198.97	2,892.79	3,568.30	4,214.96	14,372.75
	10.4%	15.3%	20.1%	24.8%	29%	
Moderate-Severe Anxiety among Children, 10-14 years	41.27	61.25	79.36	97.57	115.31	394.77
	10.5%	15.5%	20.1%	24.7%	29%	
Bipolar disorder, 15+ years	9,868.97	13,674.35	16,776.62	18,577.09	22,292.38	81,189.40
	12.2%	16.8%	20.7%	22.9%	27%	
Conduct disorder, 5-19 years	777.87	1,486.60	2,263.41	3,089.07	3,949.35	11,566.30
	6.7%	12.9%	19.6%	26.7%	34%	
Dementia, 40+ years	463.95	761.48	1,097.38	1,480.89	1,917.71	5,721.41
	8.1%	13.3%	19.2%	25.9%	34%	
Depression, 15+ years	1,184.79	2,047.26	2,917.73	3,785.10	4,635.83	14,570.69
	8.1%	14.1%	20.0%	26.0%	32%	
Moderate-Severe Depression among Children, 10-14 years	3.94	6.85	9.52	12.15	14.77	47.22
	8.3%	14.5%	20.2%	25.7%	31%	
Epilepsy, 1+ years	654.17	813.89	975.81	1,137.97	1,298.51	4,880.34
	13.4%	16.7%	20.0%	23.3%	27%	
Idiopathic developmental intellectual disability, 1+ years	335.92	533.46	722.08	909.12	1,088.94	3,589.51
	9.4%	14.9%	20.1%	25.3%	30%	
Perinatal depression, 15 – 49 years	212.87	461.45	686.46	907.64	1,125.61	3,394.03
	6.3%	13.6%	20.2%	26.7%	33%	
Psychosis, 15+ years	4,194.63	5,836.80	7,579.24	9,411.85	11,323.31	38,345.83
	10.9%	15.2%	19.8%	24.5%	30%	
Substance-use disorder, 15+ years	1,830.38	7,379.85	13,340.92	19,729.21	26,475.61	68,755.98
	2.7%	10.7%	19.4%	28.7%0	39%	
Total	**22,542.53**	**38,156.75**	**53,727.97**	**68,657.08**	**86,029.98**	**269,114.31**
	8.4%	**14.2%**	**20.0%**	**25.5%**	**32%**	

MTEF period (years one to three), and decline gradually over the subsequent MTEF periods over the 15-year scale-up period. For the first year of scale-up the total cost of treatment and rehabilitative interventions amounts to 5.8 billion, 7.5 billion and 9.2 billion for year(s) one, two and three, respectively.

Table 13 outlines the total investment in Treatment and Rehabilitative Interventions per MTEF period over 15-years as well as their relative contributions to the total cost of treatment scale-up. The cumulative 15-year investment for the scale-up of all treatment and rehabilitative interventions amounts to 269.1 billion. On account of a gradual increase in coverage for each modelled intervention package over the 15-year period, the absolute appropriation estimates for each MTEF period increase, as a proportion of the total cumulative investment. Estimates of the total appropriation for the first MTEF period represents 8.4% of the total cumulative investment, increasing to 32% in the last MTEF period (i.e., years 12 to 15), on average, across all disorder groups and intervention packages. The total estimated appropriations for the scale-up of treatment and rehabilitative interventions for each MTEF period amount to ZAR 22.5; 38.6; 53.7; 68.6; and 86.0 (ZAR, billion), respectively.

Early Interventions for Risky Alcohol and Substance-use

In the first year of implementation, cost estimates for the delivery of brief interventions for risky alcohol- and substance-use amount to ZAR 578 million (Table 14) with the cost of implementation for the subsequent years of the first MTEF period amounting to ZAR 789.3 million and ZAR 1.0 billion, respectively, for year(s) two and three. As can be seen for costs related to treatment and rehabilitative services, the relative year-on-year average growth in annual appropriations increase most significantly in the first MTEF period, subsequently declining over the following years of scale-up. On average, service scale-up for addressing risky alcohol-use represents 62% of the cumulative investment for early interventions, on account of the higher prevalence of risky alcohol-use in South Africa, compared to risky substance-use.

In total, between the base year and 15-year milestone, the total investment required to scale up the identification and delivery of brief interventions addressing risky alcohol and substance-use is approximately ZAR 32.0 billion (Table 15). While moderate scale-up estimates were modelled up to 30% of those in need, the large cost is on account of the significantly high prevalence of risky alcohol and substance-use in the country.

Table 14 Medium Term Estimates of Annual Appropriations for Early Interventions targeting Risky Alcohol and Substance-use and Average Year-on-Year increases per MTEF period over 15-year scale-up

		Medium Term Estimates Annual Appropriations, ZAR, million			Average Annual Year-on-Year Growth Rate per MTEF period over 15-year scale-up, %				
Target Population		**Year 1**	**Year 2**	**Year 3**	**Year 1-3**	**Year 4-6**	**Year 7-9**	**Year 10-12**	**Year 12-15**
Risky Alcohol use, 15+ years		358.25	487.44	618.85	31.5%	18.0%	11.7%	8.7%	7.0%
Risky Substance use, 15+ years		219.79	301.93	386.56	32.7%	18.9%	12.5%	9.4%	7.5%
	Total	**578.04**	**789.37**	**1,005.41**	**32.0%**	**18.4%**	**12.0%**	**9.0%**	**7.2%**

Table 15 Total Investment in Early Interventions targeting Risky Alcohol and Substance-use per MTEF period over 15-year Scale-up.

		Medium Term Appropriation Estimates per MTEF period over 15-year scale-up ZAR, million, % of 15-year total					Cumulative 15-year Investment ZAR, million
Target Population		**Year 1-3**	**Year 4-6**	**Year 7-9**	**Year 10-12**	**Year 12-15**	
Risky Alcohol use, 15+ years		1,465	2,653	3,850	5,061	6,285	**19,314**
		7.6%	13.7%	19.9%	26.2%	33%	
Risky Substance use, 15+ years		908	1,682	2,493	3,340	4,216	**12,639**
		7.2%	13.3%	19.7%	26.4%	33%	
	Total	**2,373**	**4,335**	**6,344**	**8,400**	**10,502**	**31,953**
		7.4%	**13.6%**	**19.9%**	**26.3%**	**33%**	

Population-level School-Based Interventions

As mentioned earlier, the cost model for population-level school-based interventions was developed by WHO consultants and as such, parameter adjustments to reflect the local South African context was limited, in part, and may require further refinement (a detailed discussion of the input estimates and approach to the return-on-investment analyses for these interventions is provided in PART D, *Achieving a Sustained and Integrated Response,* page 119). In the first year of implementation, costs for the delivery of universal and indicated SEL interventions in schools each amount to approximately ZAR 17.0 million; whilst subsequent annual costs for the following two years of the first MTEF period amount to ZAR 23.4 and ZAR 160.3 million, respectively, for the universal school-based social and emotional learning (SEL) programme and ZAR 23.6 and ZAR 162, respectively for the indicated SEL programme (Table 16).

Costs gradually increase as service planning is completed at the end of year two, with an increase in the number of schools reached, starting from 5% in year-3 to 91% in the final year. Increases in the number of learners reached similarly start from 5% in year-3 however, on account of population growth, reach 85% of all learners (12-17 years) in the final year. As a result, the relative year-on-year average growth in annual appropriations increases most significantly in the second MTEF period; the average year-on-year increase in annual investment in the first MTEF period is in the region of 8.5% (for both programmes) with a significant increase in the second MTEF period (year four-six) of an average year-on-year increase of 22% as the programme moves to the roll-out phase and learners begin receiving the intervention; annual year-on-year increases for the remaining MTEF periods (i.e. year seven to year 15) are nominal, estimated at 0.1-0.3%. In total, between 2021 and 2035, the total investment required to scale up SEL programmes in schools is estimated to be ZAR 3.2 billion for both the universal and indicated SEL interventions, respectively (Table 17).

While the total costs for delivering both the universal and the indicated SEL interventions are relatively equal, the cost-per-learner reached is markedly different. The indicated SEL programme targets students with subthreshold depression symptoms, specifically. As a result, from year three, in which learners begin receiving the intervention, and the final year modelled (year 15), where 91% of schools have been reached, the average cost-per-learner reached in the indicated intervention declines from ZAR 1040.1 to ZAR 965.3, whilst the average cost-per-learner reached under the universal SEL programme declines from ZAR 51.28 to ZAR 47.19.

Table 16 Medium Term Estimates of Annual Appropriations for School-based socio-emotional learning (SEL) programmes and Average Year-on-Year increases per MTEF period over 15-year scale-up

	Medium Term Estimates Annual Appropriations, ZAR, million			**Average Annual Year-on-Year Growth Rate per MTEF period over 15-year scale-up,** %				
Target Population	**Year 1**	**Year 2**	**Year 3**	**Year 1-3**	**Year 4-6**	**Year 7-9**	**Year 10-12**	**Year 12-15**
Indicated, school-based, social and emotional learning SEL interventions, Learners 12-17 years	16.88	23.58	162.56	8.63%	21.3%	0.1%	0.3%	0.3%
Universal, school-based, social and emotional learning SEL interventions, Learners 12-17 years	16.88	23.41	160.30	8.50%	22.8%	-0.2%	0.0%	0.0%

Table 17 Total Investment in School-based socio-emotional learning (SEL) programmes per MTEF period over 15-year Scale-up.

	Medium Term Appropriation Estimates per MTEF period over 15-year scale-up ZAR, million, % of 15-year total					**Cumulative 15-year Investment** ZAR, million
Target Population	**Year 1-3**	**Year 4-6**	**Year 7-9**	**Year 10-12**	**Year 12-15**	
Indicated, school-based, social and emotional learning SEL interventions, Learners 12-17 years	203.02	594.41	801.24	809.09	811.64	**3,219.40**
	6.30%	6.30%	6.30%	6.30%	6.30%	
Universal, school-based, social and emotional learning SEL interventions, Learners 12-17 years	200.60	590.56	805.36	806.87	805.36	**3,208.76**
	6.25%	6.25%	6.25%	6.25%	6.25%	

Forensic Mental Health

In the first year of implementation, the estimated appropriation for the provision of forensic assessments for all forensic cases amounts to ZAR 335.8 million (Table 18), with the two subsequent years of the first MTEF period amounting to ZAR 339.7 and ZAR 343.9 million, respectively.

In total, between the first and final year of the 15-year period, the total investment required to undertake forensic assessments amounts to ZAR 5.43 billion. All forensic cases assumed to accrue per year are modelled to receive forensic assessments (i.e. the coverage of forensic assessments remains 100% throughout the 15-year period). Whilst only addressing a small population, the costs associated with forensic assessments are substantial, particularly in light of the dominance of inpatient-only forensic assessments, estimated to require 30 days of inpatient care per forensic case. The estimated appropriations for forensic assessments during all five MTEF cycles occurring during the 15-year period, relative to the cumulative total investment, stays consistent, only increasing modestly on account of population growth, from a total of ZAR 1.0 billion for the first MTEF period (year(s) one-three) to ZAR 1.2 billion in the final MTEF period (year(s) 12-15) (Table 19).

Table 18 Medium Term Estimates of Annual Appropriations Forensic Assessments and Average Year-on-Year increases per MTEF period over 15-year scale-up

		Medium Term Estimates Annual Appropriations, ZAR, million			Average Annual Year-on-Year Growth Rate per MTEF period over 15-year scale-up, %				
Target Population		**Year 1**	**Year 2**	**Year 3**	**Year 1-3**	**Year 4-6**	**Year 7-9**	**Year 10-12**	**Year 12-15**
Forensic Cases		335.75	339.70	343.90	1.2%	1.1%	1.0%	0.9%	0.9%
	Total	**335.75**	**339.70**	**343.90**					

Table 19 Total Investment in Forensic Assessments per MTEF period over 15-year Scale-up.

		Medium Term Appropriation Estimates per MTEF period over 15-year scale-up ZAR, million, % of 15-year total					Cumulative 15-year Investment ZAR, million
Target Population		**Year 1-3**	**Year 4-6**	**Year 7-9**	**Year 10-12**	**Year 12-15**	
Forensic Cases		1,019.34	1,054.23	1,086.62	1,117.95	1,148.47	5,426.61
		18.8%	19.4%	20.0%	20.6%	21%	
	Total	**1,019.34**	**1,054.23**	**1,086.62**	**1,117.95**	**1,148.47**	**5,426.61**
		18.8%	**19.4%**	**20.0%**	**20.6%**	**21%**	

10.
Impact Assessment

Health Impacts

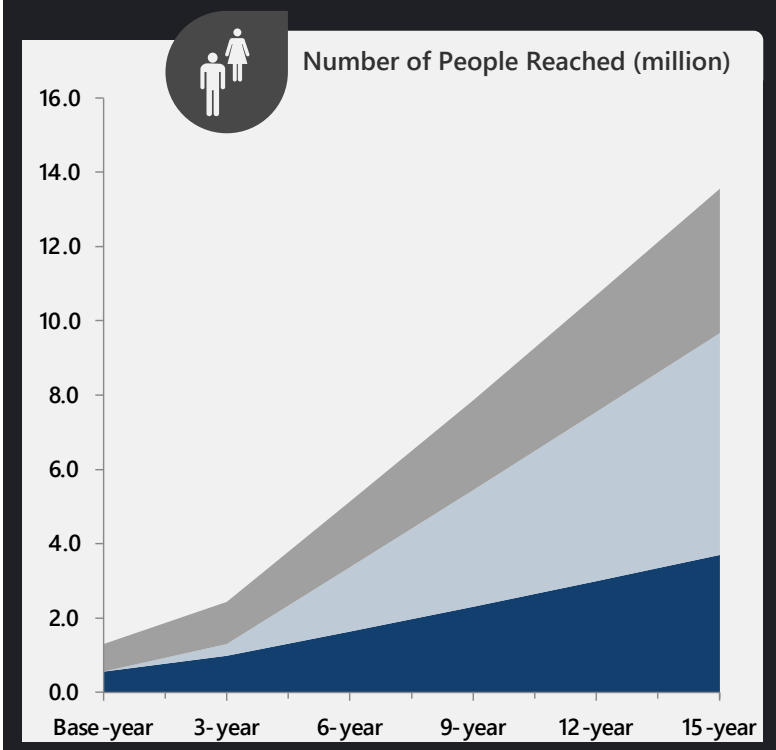
Total population health gains over the 15-year scale-up period are summarized in Table 20. Health impacts of scale-up for mental health care increase over time on account of the incremental increases in coverage. By the end of the scale-up period, approximately 2.2 million years of healthy life will be restored through the provision and scale-up of treatment and rehabilitative services, with close to 2.5 million prevalent cases averted and over 44,000 deaths avoided. The relatively modest number of deaths averted is on account of the nature of MNS disorders, placing a substantially higher burden on morbidity than mortality. Through early interventions for risky alcohol and substance-use, 286,439 years of healthy life will be restored, with 773,155 prevalent cases averted and almost 40,000 deaths avoided. Given the high prevalence of risky alcohol-use, depression, anxiety and perinatal depression, the health impacts of scaled-up interventions addressing these disorders are proportionally greater. Universal SEL programmes contribute significantly to averting prevalent cases of depression and anxiety, resulting in over 415,000 cases averted, in addition to achieving over 89,000 healthy life years gained. These gains are substantial when compared to the Indicated SEL programmes, as outlined in Table 20.

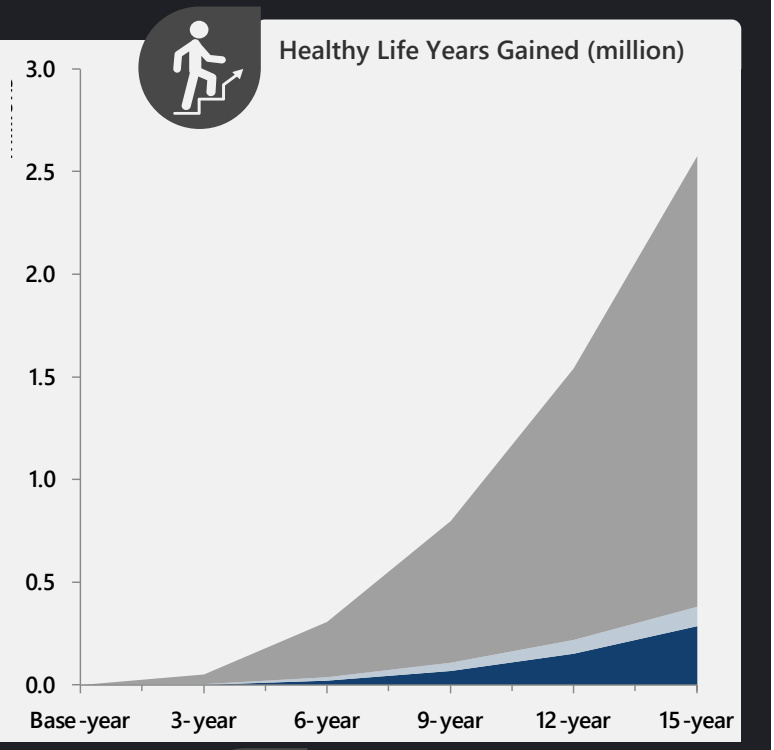
Table 20 Cumulative Healthy Life-years Gained and Averted Prevalent Cases and Deaths over scale-up period

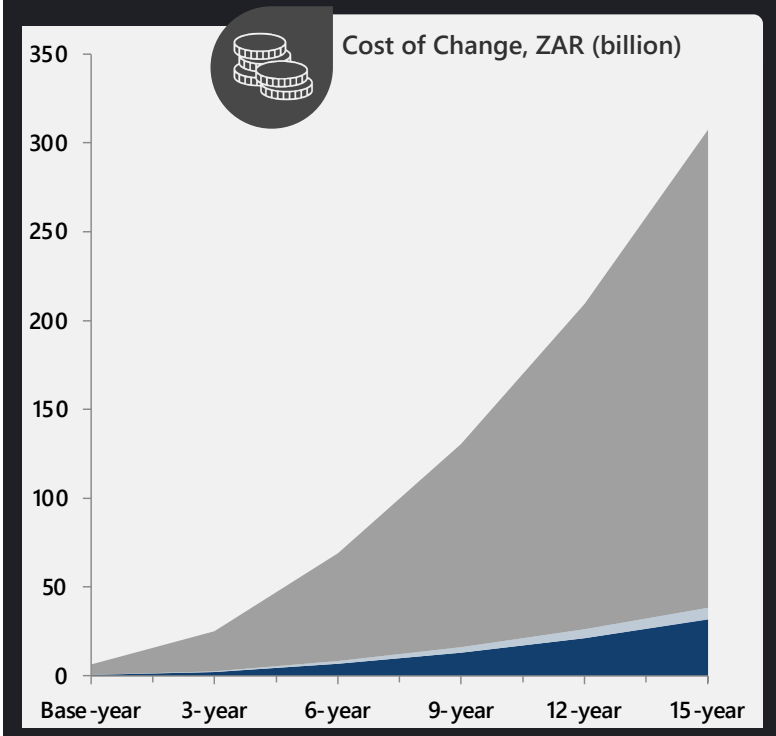
Target Population	Prevalent Cases Averted	Deaths Averted	Healthy Life Years Gained
ADHD, 5-19 years	-	-	4,446
Alcohol use disorder, 15+ years	158,517	10,110	125,438
Anxiety disorders, 15+ years	589,755	-	270,717
Moderate-Severe Anxiety among Children, 10-14 years	13,171	-	3,873
Bipolar disorder, 15+ years	-	21,879	179,807
Conduct disorder, 5-19 years	-	-	73,911
Dementia, 40+ years	-	-	7,345
Depression, 15+ years	1,341,736	7,055	860,567
Moderate-Severe Depression among Children, 10-14 years	10,514	4	2,911
Epilepsy, 1+ years	87,402	1,388	207,268
Idiopathic developmental intellectual disability, 1+ years	-	-	7,551
Perinatal depression, 15 – 49 years	287,888	3,753	262,803
Psychosis, 15+ years	-	-	146,896
Substance-use disorder, 15+ years	34,146	394	20,767
Total (Treatment and Rehabilitative Services)	2,523,129	44,583	2,174,300
Risky Alcohol use, 15+ years	525,329	32,272	233,700
Risky Substance use, 15+ years	247,826	725	52,739
Total (Early Intervention: Risky Alcohol and Substance-use)	773,155	32,997	286,439
Indicated, school-based, social and emotional learning (SEL) interventions, Learners 12-17 years	26,541	3	5,526
Universal, school-based, social and emotional learning (SEL) interventions, Learners 12-17 years	415,309	154	89,775

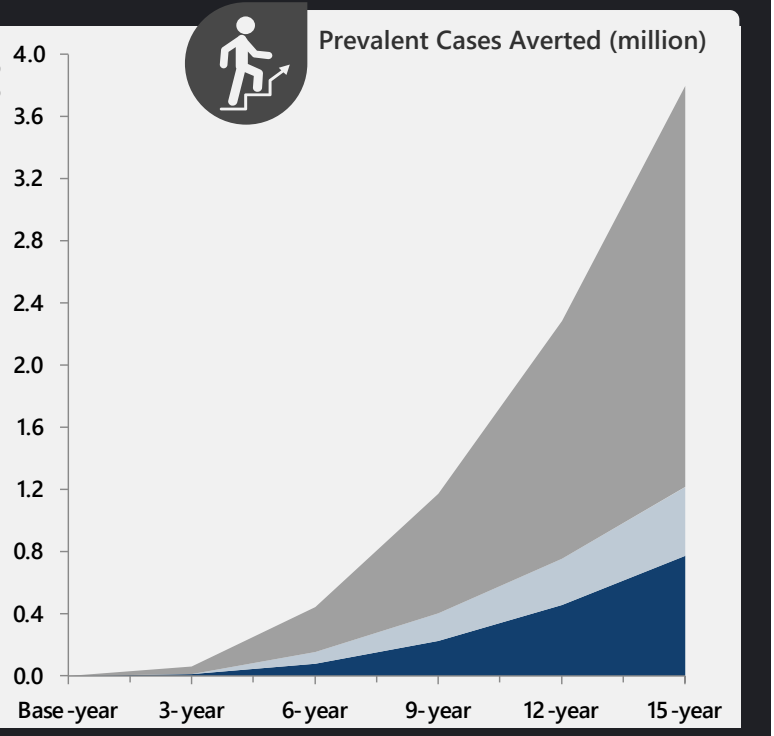
Snapshot

Costs, People Reached & Health Impacts over 15-years









School-based, social and emotional learning (SEL) interventions
Early Intervention for Risky Alcohol and Substance-use
Treatment and Rehabilitative Interventions

11.
Returns on Investment

In this section of the Report, we summarize the total investments necessary for scaling up all packages of care, the total economic value of the instrumental benefits of restored productivity associated with service scale-up and the total intrinsic value of better health and well-being, over the 15-year period, all expressed as net present value estimates (Table 21). Benefit-to-cost ratios are presented first including only the present value of economic productivity returns; and subsequently including both the value of economic productivity and social value. When these intrinsic benefits of better health are added to the instrumental benefits of restored production, the ROI evidently improves. Similarly, the results of our sensitivity analysis, which account for both: (1) a 1.6% annual growth in GDP starting from the second year of the 15-year scale-up period, and (2) the net present value of avoided health care expenditures over the scale-up period, are reported. When health care savings and modest[2] GDP growth are accounted for, the ROI ratios improve further for interventions targeting certain populations. For ease of interpretation, a visual snapshot of these results, presented by disorder, is provided through Figure 4 (page 70).

[2] Notably population growth increases by 1.2%, annually in our model, meaning the relative GDP increase applied of 1.6% can be conservatively thought of as a net GDP improvement of 0.4% year-on-year.

Table 21 Summary of Cost of Scale-Up, Value of Restored Economic Productivity and Health, Health Savings and Return-on-Investment , ZAR, millions, Net Present Value

Target Population	Investment: Cost of scaled up treatment	Return: Value of restored productivity	ROI: Ratio of restored productivity to cost	Return: Value of restored health	Total: Value of restored productivity and restored health	ROI: Ratio of restored productivity and health to cost	Return: Value of health care savings	Total: Value of restored productivity, health and savings	ROI: Ratio of restored productivity, health and savings to cost
Treatment and Rehabilitative Interventions									
ADHD, 5-19 years	2,289.28	0.00	0.00	118.32	118.32	0.05	0.00	118.32	0.05
Alcohol use disorder, 15+ years	14,336.08	3,468.07	0.24	3,257.42	6,725.48	0.47	422.07	7,147.55	0.51
Anxiety disorders, 15+ years	10,942.06	8,983.42	0.82	7,090.26	16,073.68	1.47	830.79	16,904.47	1.58
Moderate-Severe Anxiety among Children, 10-14 years	300.71	66.98	0.22	100.78	167.76	0.56	26.52	194.28	0.66
Bipolar disorder, 15+ years	62,440.77	10,571.69	0.17	4,805.31	15,377.00	0.25	0.00	15,377.00	0.25
Conduct disorder, 5-19 years	8,627.08	0.00	0.00	1,965.98	1,965.98	0.23	0.00	1,965.98	0.23
Dementia, 40+ years	4,290.09	0.00	0.00	194.00	194.00	0.05	0.00	194.00	0.05
Depression, 15+ years	10,966.04	21,572.91	1.97	22,782.29	44,355.19	4.04	2,946.99	47,302.18	4.39
Moderate-Severe Depression among Children, 10-14 years	35.61	53.92	1.51	75.84	129.76	3.64	21.20	150.96	4.30
Epilepsy, 1+ years	3,766.47	1,466.24	0.39	5,466.96	6,933.20	1.84	120.73	7,053.93	1.89
Idiopathic developmental intellectual disability, 1+ years	2,719.30	0.00	0.00	200.83	200.83	0.07	0.00	200.83	0.07
Perinatal depression, 15 – 49 years	2,535.09	4,878.74	1.92	6,975.21	11,853.95	4.68	896.47	12,750.42	5.11
Psychosis, 15+ years	29,219.67	8,578.80	0.29	3,899.46	12,478.26	0.43	0.00	12,478.26	0.43
Substance-use disorder, 15+ years	50,234.09	560.48	0.01	538.83	1,099.31	0.02	1,418.85	2,518.16	0.05
Early Intervention for Risky Alcohol and Substance-use									
Risky Alcohol use, 15+ years	14,492.74	11,427.31	0.79	6,047.99	17,475.30	1.21	349.88	17,825.18	1.26
Risky Substance use, 15+ years	9,456.51	3,866.92	0.41	1,374.68	5,241.60	0.55	215.51	5,457.11	0.59
School-based social and emotional learning Interventions									
Indicated SEL, Learners 12-17 years	2,453.17	139.60	0.06	148.43	288.03	0.12	61.14	349.18	0.14
Universal, SEL, Learners 12-17 years	2,443.56	2,200.73	0.90	2,419.20	4,619.92	1.89	959.03	5,578.95	2.28

Treatment and Rehabilitation

It is estimated that the economic value of restored productivity over the scale-up period amounts to ZAR 60.2, and ZAR 117.7 billion when quantifying the social value of the investment as well (Table 21). Whilst this overall value is lower than the expected investment for scale-up, amounting to approximately ZAR 202.7 billion when reflecting on these ratios specifically for each disorder, many report returns that exceed the investments required for scale-up (Figure 4). These largely relate to interventions for adult anxiety, with returns on investment estimated at 1.5, with returns on investment for adult, childhood and perinatal depression estimated at 4.0, 3.6 and 4.7 respectively. Additionally, the return on investment estimated for epilepsy is 1.8.

For children, it is important to consider the social value of their investment and not just the economic value, as they do not form part of the formal job sector at present, and therefore improvements in their outcome would not translate into immediate effects on presenteeism and absenteeism – although they are likely to do so in future. Only mortality and prevalent cases averted in the case of childhood depression could be considered with regards to the economic returns; whilst interventions for childhood anxiety could only be measured with regards to prevalent cases averted, as interventions do not translate to reduced mortality. With regards to interventions addressing developmental disorders, conduct disorder, ADHD only the social value of the investment is considered, as they too are not considered to form part of the active labour force. A similar conservative approached was applied for dementia, despite some still forming part of the labour force.

It is important to bear in mind that not all interventions would translate into remission, particularly for interventions for psychosis, bipolar disorder, intellectual disability, and dementia. These represent lifelong conditions, and only improvements in functioning and mortality could be expected through treatment scale-up. Whilst the ROI analysis does not subtract the health savings from the cost-of scale-up, these savings bear mention. Significant savings are estimated for interventions addressing anxiety and depression, particularly for adults, as well as perinatal depression on account of the significant burden of disease imposed by these conditions in the population. Savings through interventions addressing alcohol-use disorder are also relatively large, although savings on account of addressing substance-use disorders are even larger on account of the significant medication and inpatient costs required for treatment. The total value of health care savings due to treatment scale-up is estimated at 6.7 billion. When exploring the potential economic returns on account of restored productivity and health, and the additional

health care savings to the health sector, whilst assuming modest increases in the GDP annually, the value of restored productivity and health over the scale-up period amounts to 124.5 billion. These translate into positive returns on investment for adult anxiety of 1.6, 4.4, 4.3 and 5.1 for adult, childhood, and perinatal depression respectively, and 1.9 for epilepsy.

Early Interventions for Risky Alcohol and Substance use

Given the prevalence estimated for risky-alcohol and substance-abuse, only modest increases in coverage scale-up were modelled for those interventions, amounting to targets of 30% for each. Interventions are only modelled to result in increases in remission, thereby reducing the prevalent cases in the population. The total economic value of restored productivity by scaling up interventions addressing risky alcohol and substance use amount to ZAR 15.3 billion and ZAR 22.7 billion when also accounting for the economic value of improved health. This is in comparison to the 23.9 billion estimated costs of delivering these interventions over the scale-up period. Brief interventions for alcohol-use result in a positive return-on-investment when considering both the economic and social values of improved health, estimated at 1.21 at scale-up, whilst this is not estimated for brief interventions for substance-use, estimated at 0.55. Further scale-up for these interventions will likely be warranted to yield increased economic benefits.

Despite modest increases in coverage for the below-mentioned interventions, savings on account of reduced prevalent cases are estimated to amount to ZAR 349.88 million for risky alcohol use and ZAR 215.51 million for risky substance use. It is important to mention that these interventions only include brief counselling sessions, 3 sessions for alcohol-use and 4 for risky-substance use, with modest improvements in remission, estimated at 7.5% and 6% respectively, once accounting for adherence. Accounting for these savings and a GDP growth over time, the return on investment for these interventions rises to 1.3 and 0.6 for risky alcohol and substance-use respectively.

Population-level School-Based Interventions

The economic value of restored productivity modelled for indicated social and emotional learning programmes is 139.6 million and 288 million once accounting for the value of improved well-being. The economic value of restored productivity and the combined value of productivity and improved well-being for universal social and emotional learning programmes is 2.2 billion and 4.6 billion respectively. The cost of implementation for each of these interventions amounts to 2.45 and 2.44 billion respectively over the scale-up period. As mentioned in the

methodology, only restored productivity on account of mortality averted is estimated for this population group as they are not currently active in the labour force and therefore, health improvements would not translate into immediate effects on absenteeism and presenteeism as well as not quantifying the potential impacts on educational attainment during adolescence) into improved job earning potential later on in life.

Nevertheless, the returns on investment for providing universal social-emotional learning programmes yield positive returns on investment of 1.9; this intervention represents extremely good value for money, particularly on account of the significant number of prevalent cases that are averted through the intervention. Furthermore, costing has been obtained through analysis undertaken with significant training costs modelled through external consultants, in addition to significant programmatic investments, all of which are included within the cost-of-service delivery and used in the estimation of the return on investment. Costs will need to be validated with the Department of Education and can also likely be reduced significantly through local training opportunities.

The economic impact of avoiding prevalent cases through the provision of universal social-emotional learning programmes in South Africa amounts to over ZAR 959.03 million, with savings through the provision of indicated social and emotional learning programmes estimated at 61.14 million. This is on account of the number of prevalent cases avoided through the scale-up period, which is particularly significant for the universally provided SEL programme, with the average cost of treating childhood anxiety/depression applied. Children at this age were not modelled to be hospitalised but to only receive intensive psychosocial support and medication. This speaks to a strong opportunity for prevention interventions for child and adolescent mental health. When accounting for these savings and GDP growth, the returns on investment for the universal school programme increases to 2.3, whilst the indicated school-based programme still yields returns lower than the estimated cost of investment.

Increasing Returns with Increased Coverage

Figure 5 (page 80) illustrates the returns-on-investment for each modelled condition over each MTEF period, as coverage is scaled-up. From the first MTEF period, positive returns on investment are achieved for adult and perinatal depression, and by the second MTEF period, positive returns are also achieved for childhood depression and universal social and emotional learning programmes delivered in schools as well. By the third MTEF period, treatment for epilepsy demonstrates a positive return on investment, and by the 4th MTEF period, interventions for adult anxiety and risky alcohol use demonstrate positive returns on investment. All ROIs show a steady increase as increased coverage is achieved.

Figure 4 Snapshot of Total Investments, Value of Restored Productivity, Restored Health and Health Care Savings (ZAR, millions, NPV) and Benefit-to-Cost Ratios, by Target Population.

Depression, 15+ years

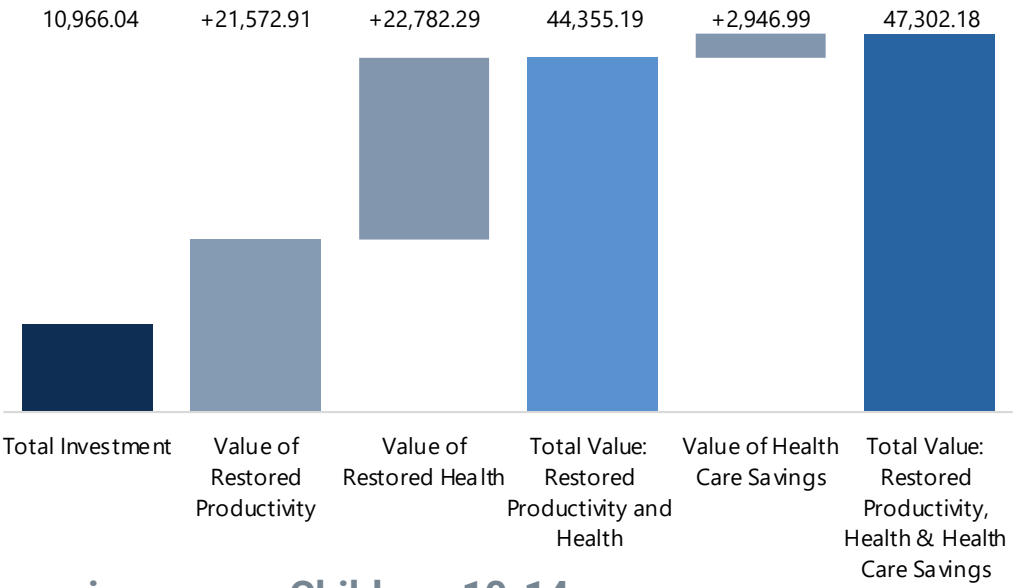
4.0

ROI Ratio: productivity and health to cost

4.4

ROI Ratio: productivity, health and savings to cost

1.6% GDP growth



Moderate-Severe Depression among Children, 10-14 years

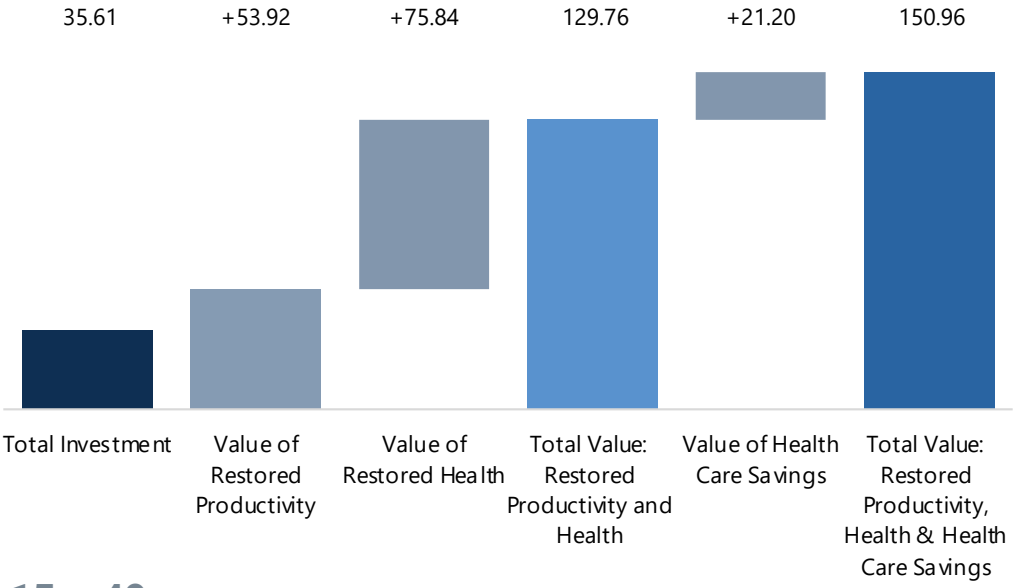
3.6

ROI Ratio: productivity and health to cost

4.3

ROI Ratio: productivity, health and savings to cost

1.6% GDP growth



Perinatal depression, 15 – 49 years

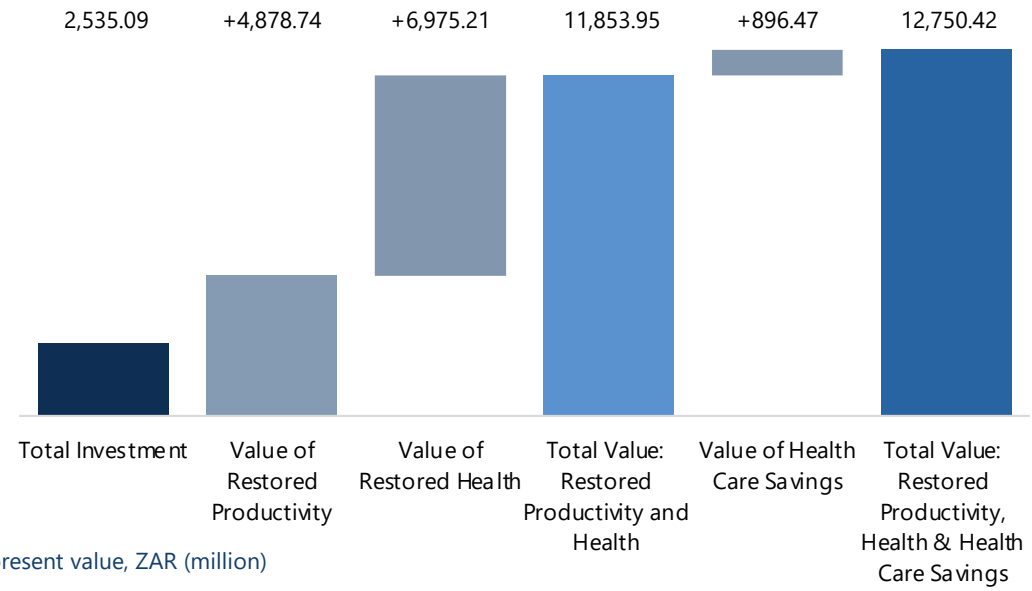
4.7

ROI Ratio: productivity and health to cost

5.1

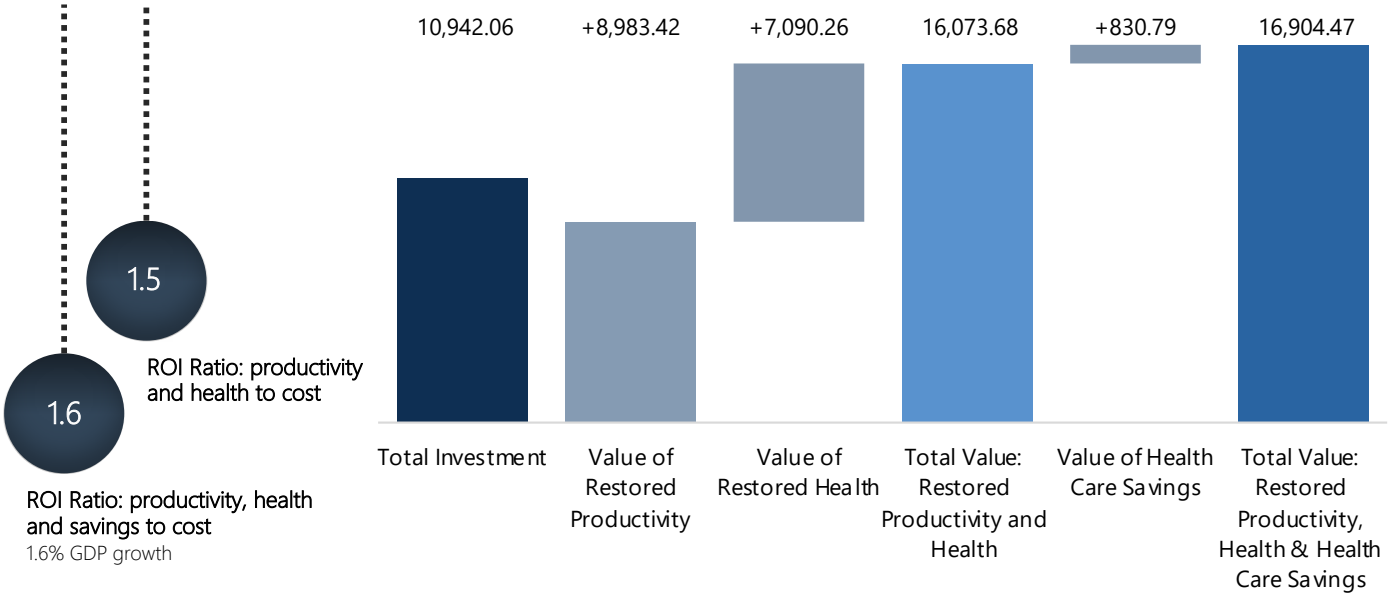
ROI Ratio: productivity, health and savings to cost

1.6% GDP growth

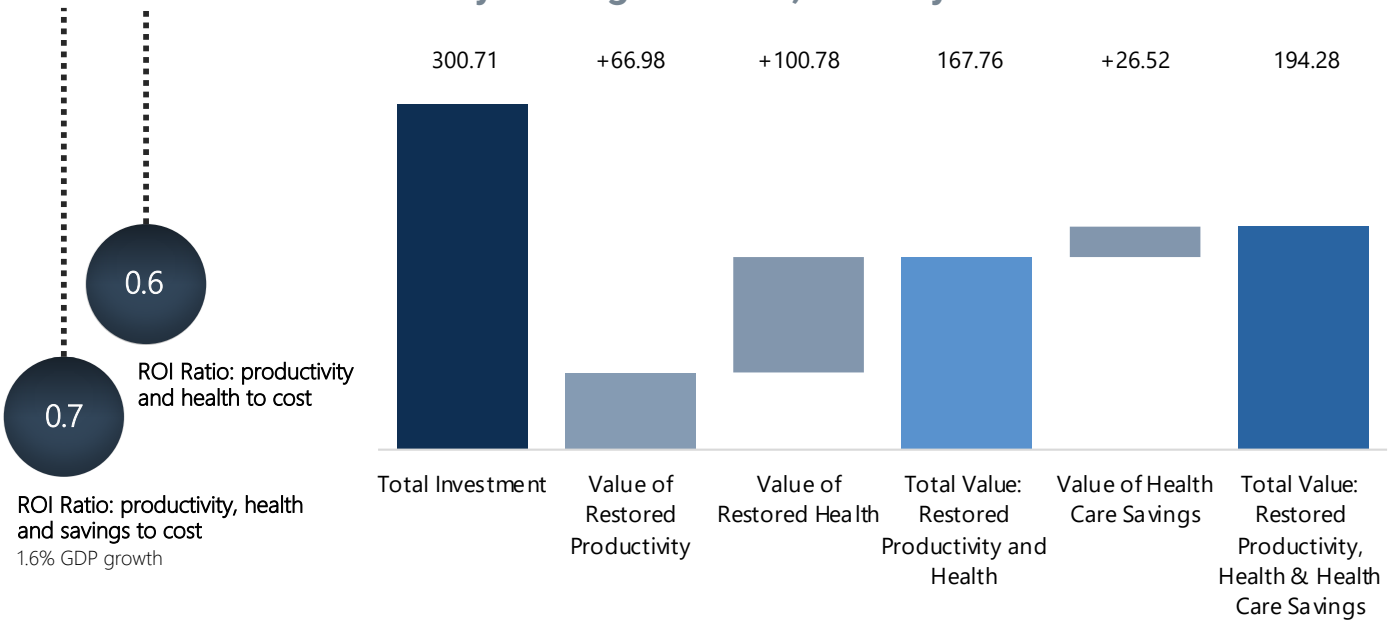


N.B: All monetary estimates reflect net present value, ZAR (million)

Anxiety disorders, 15+ years

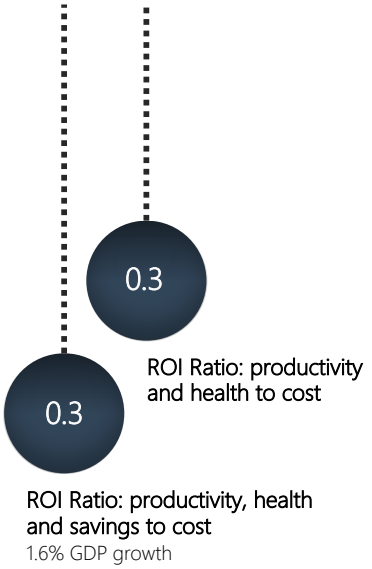


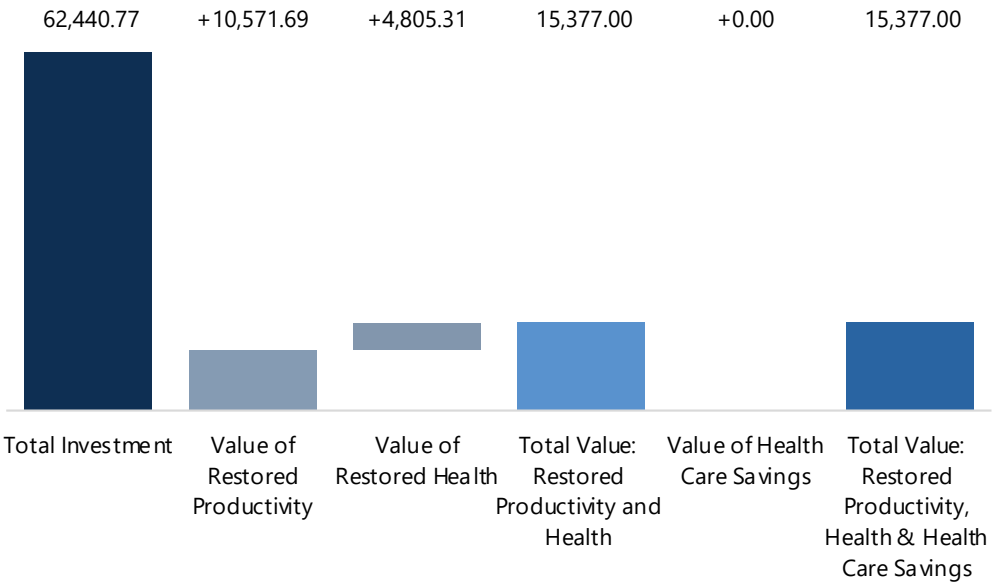
Moderate-Severe Anxiety among Children, 10-14 years



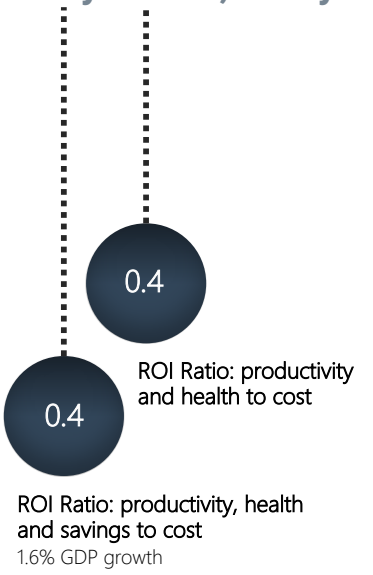
N.B: All monetary estimates reflect net present value, ZAR (million)

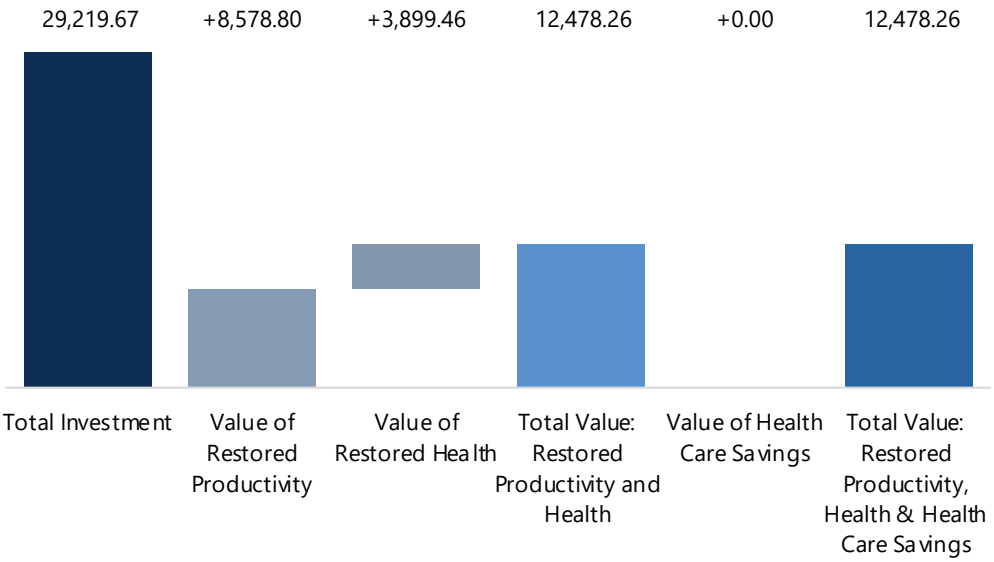
Bipolar disorder, 15+ years





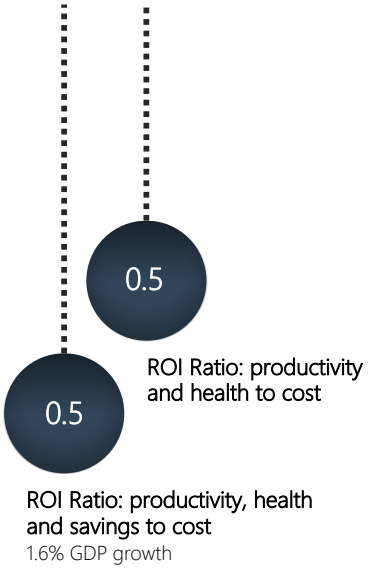
Psychosis, 15+ years

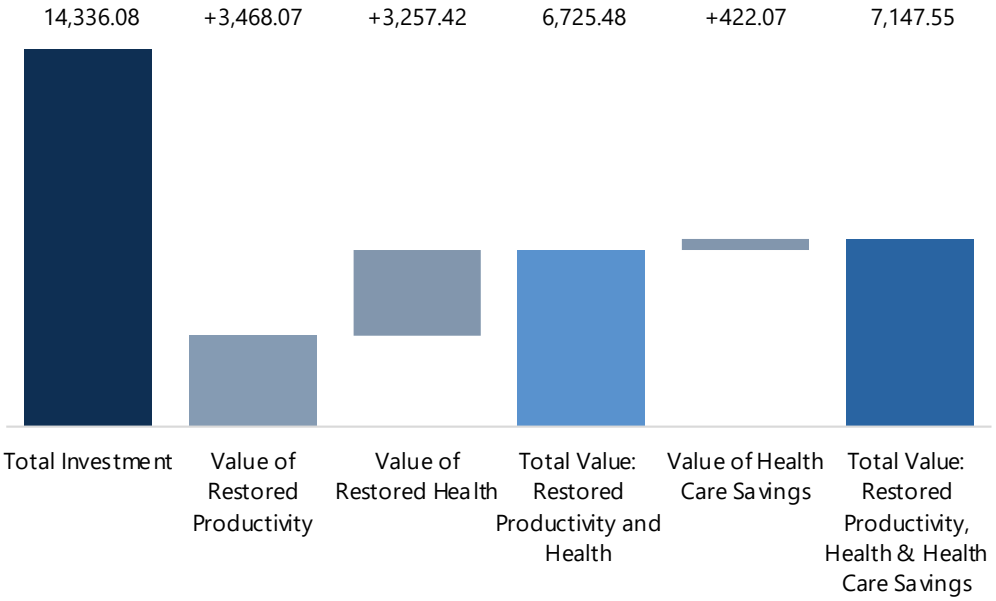




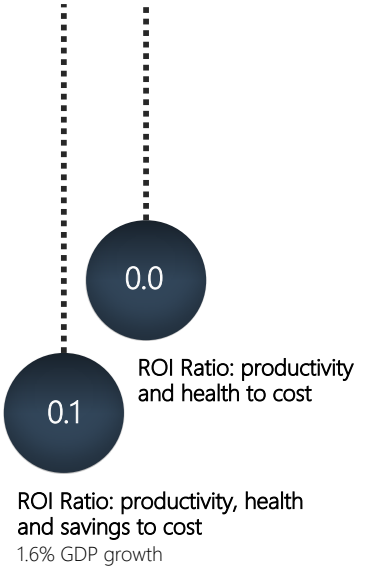
N.B: All monetary estimates reflect net present value, ZAR (million)

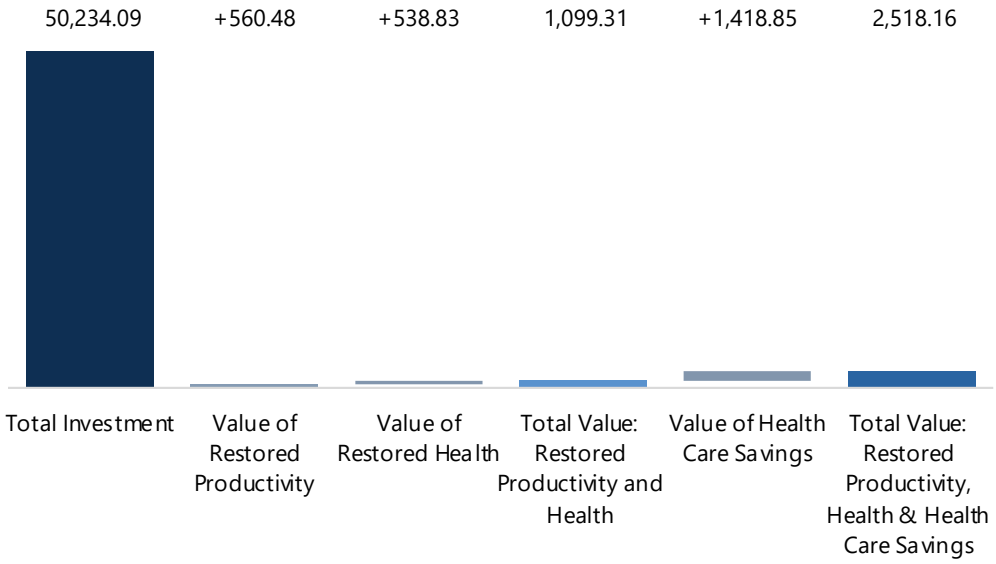
Alcohol use disorder, 15+ years





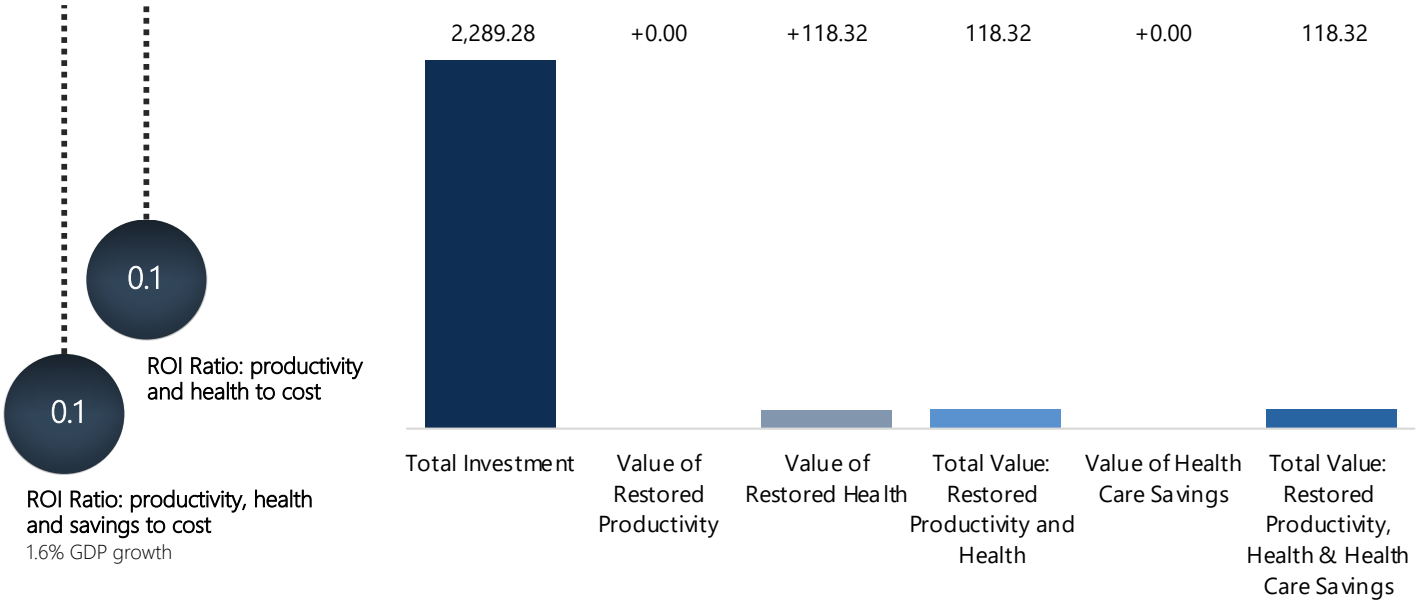
Substance-use disorder, 15+ years



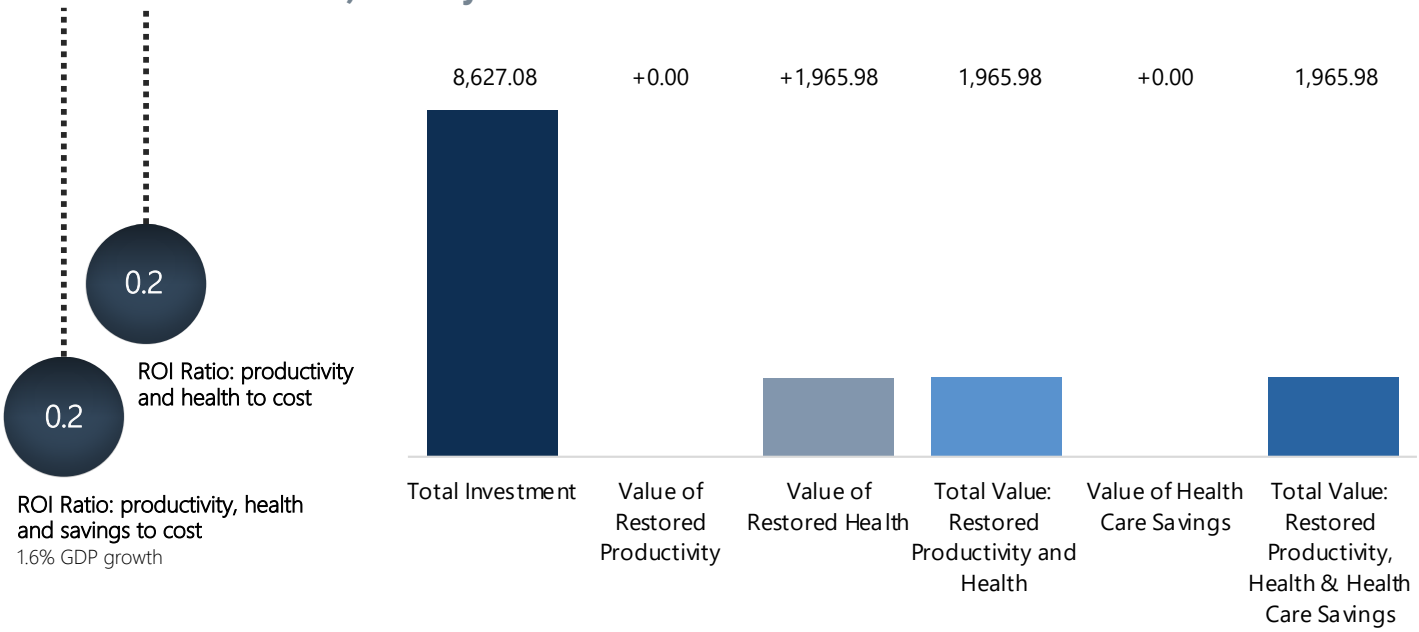


N.B: All monetary estimates reflect net present value, ZAR (million)

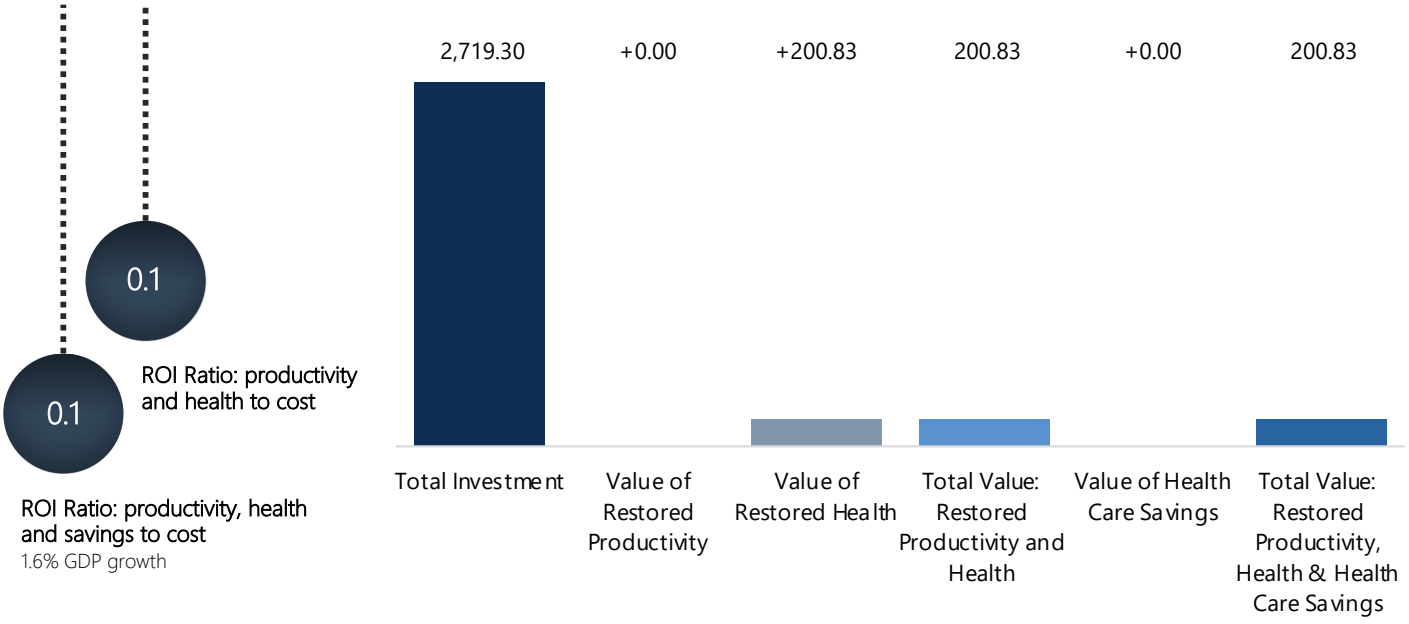
ADHD, 5-19 years



Conduct disorder, 5-19 years

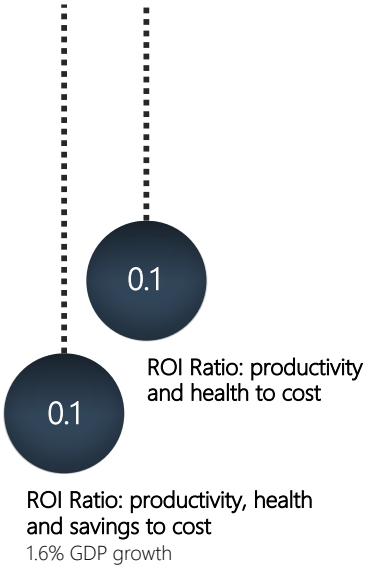


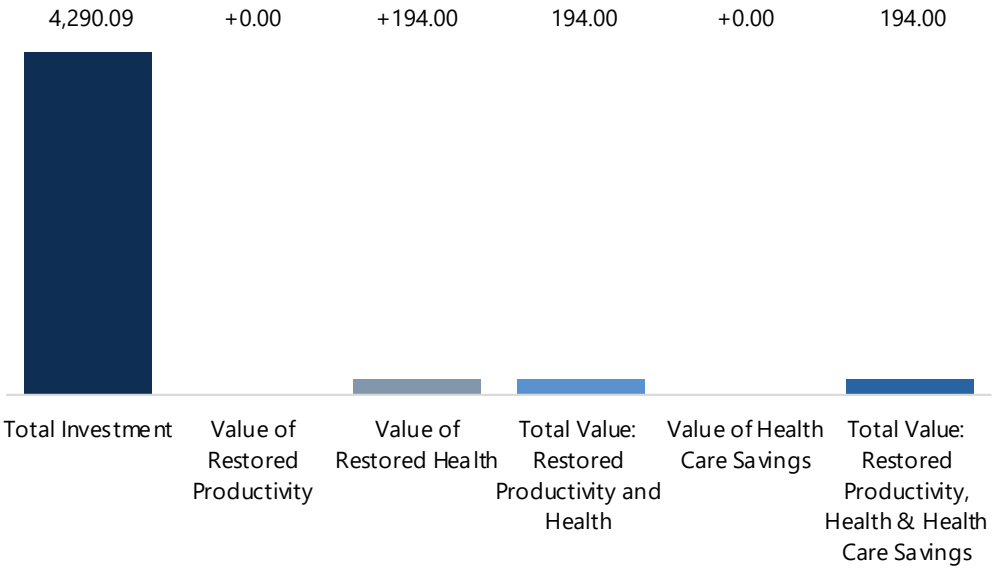
Idiopathic developmental intellectual disability, 1+ years



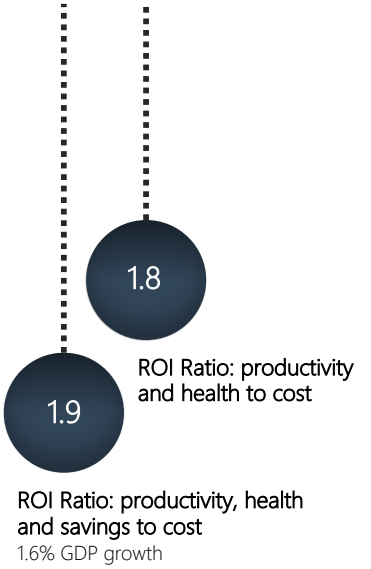
N.B: All monetary estimates reflect net present value, ZAR (million)

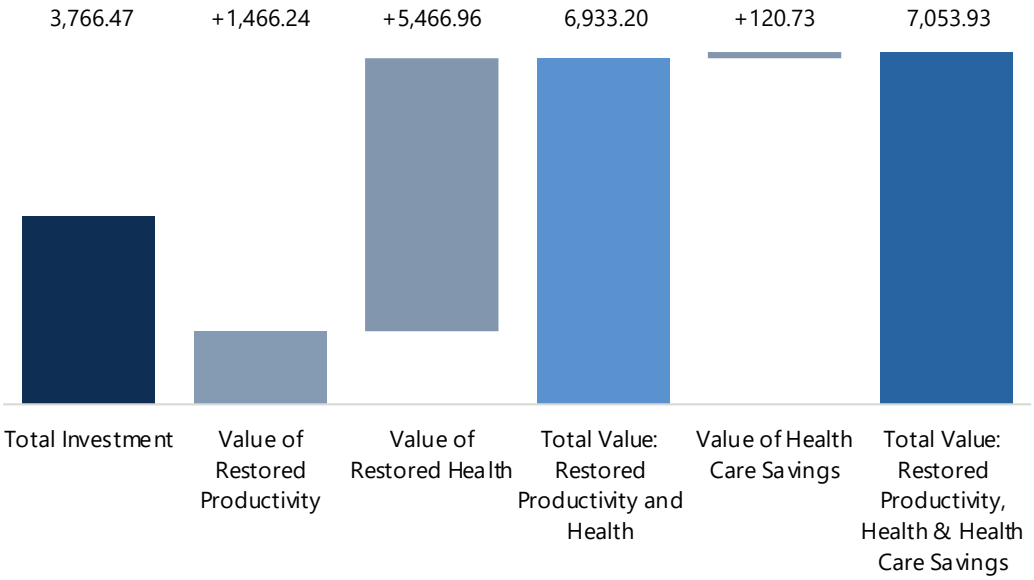
Dementia, 40+ years





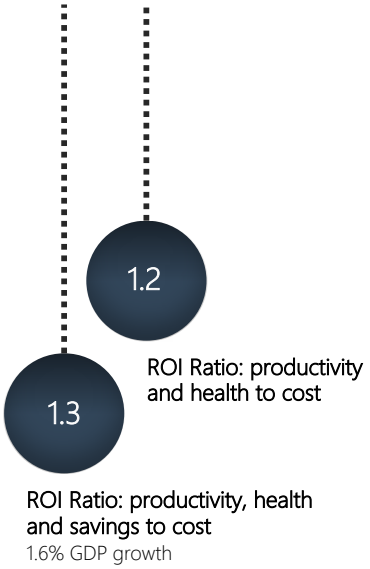
Epilepsy, 1+ years

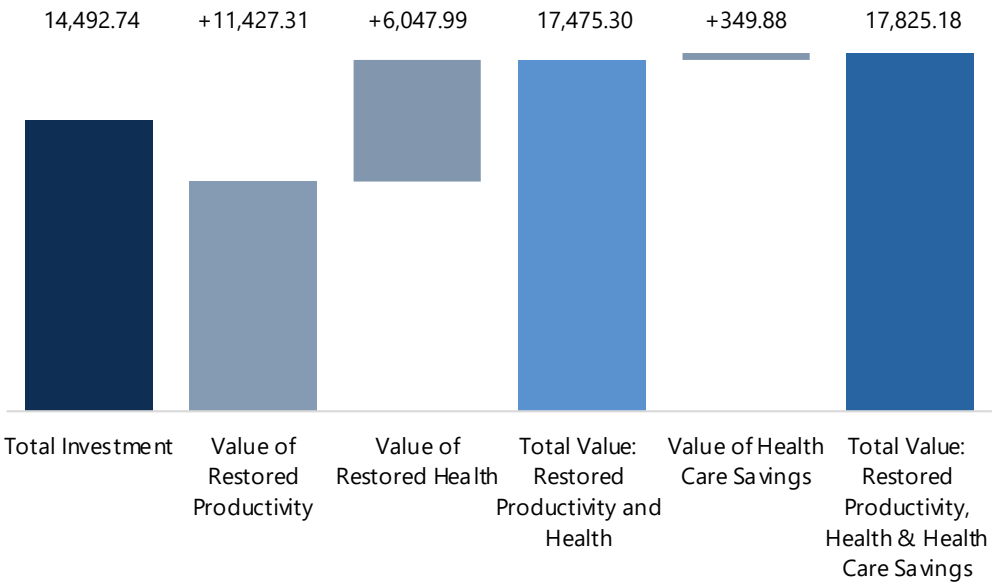




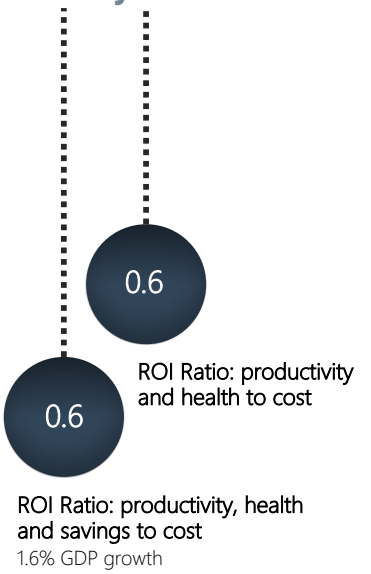
N.B: All monetary estimates reflect net present value, ZAR (million)

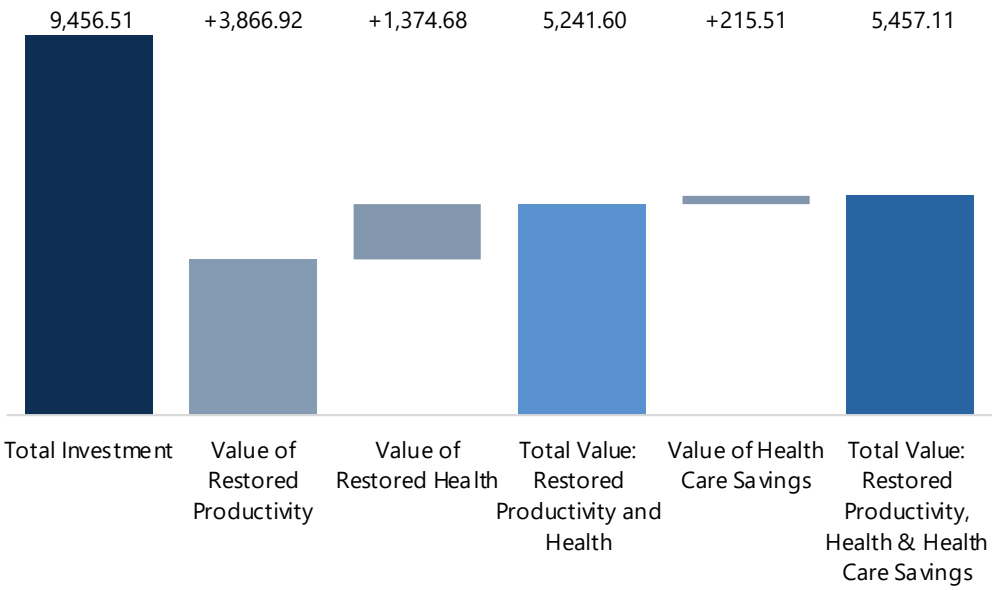
Risky Alcohol use, 15+ years





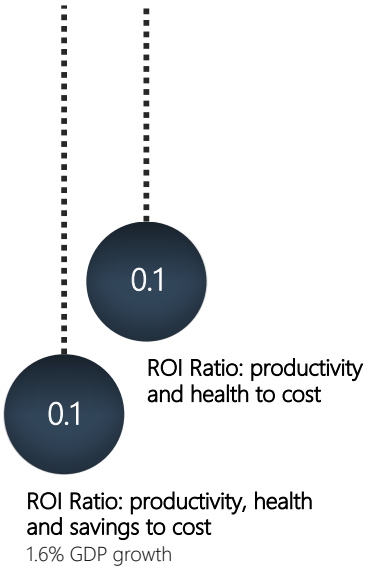
Risky Substance use, 15+ years

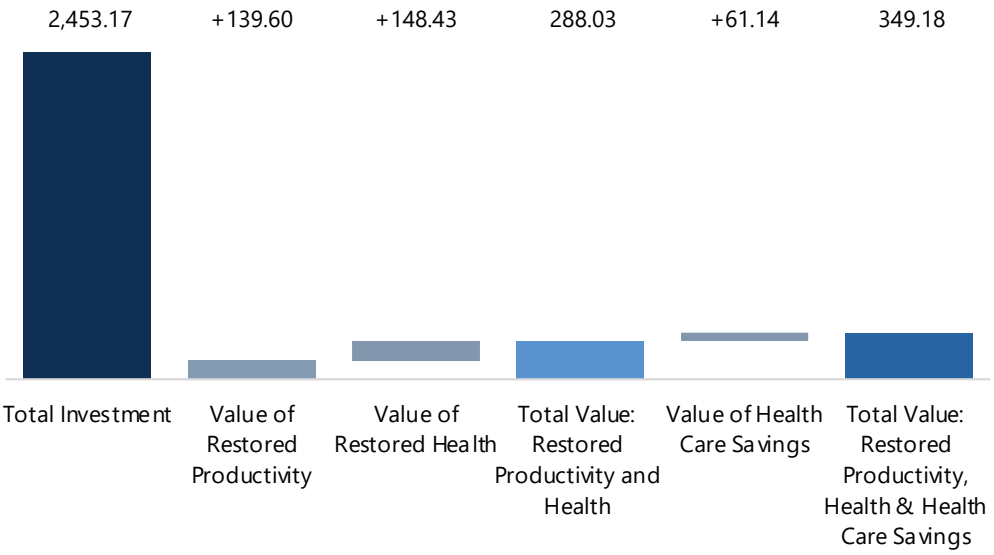




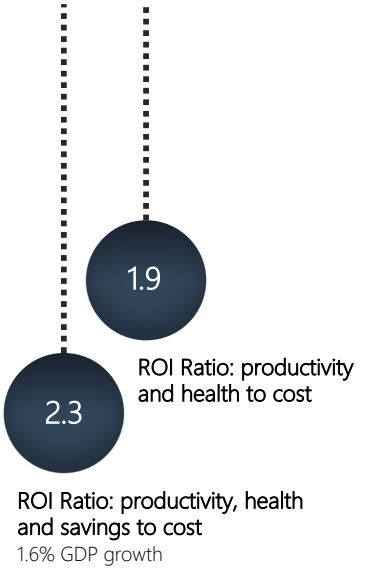
N.B: All monetary estimates reflect net present value, ZAR (million)

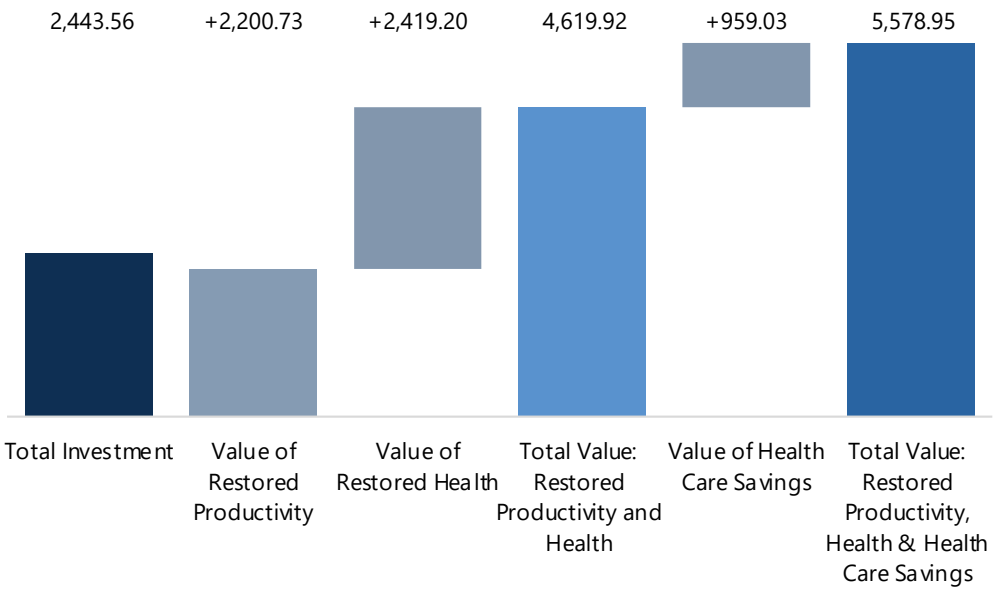
Indicated, school-based, social and emotional learning SEL interventions, Learners 12-17 years





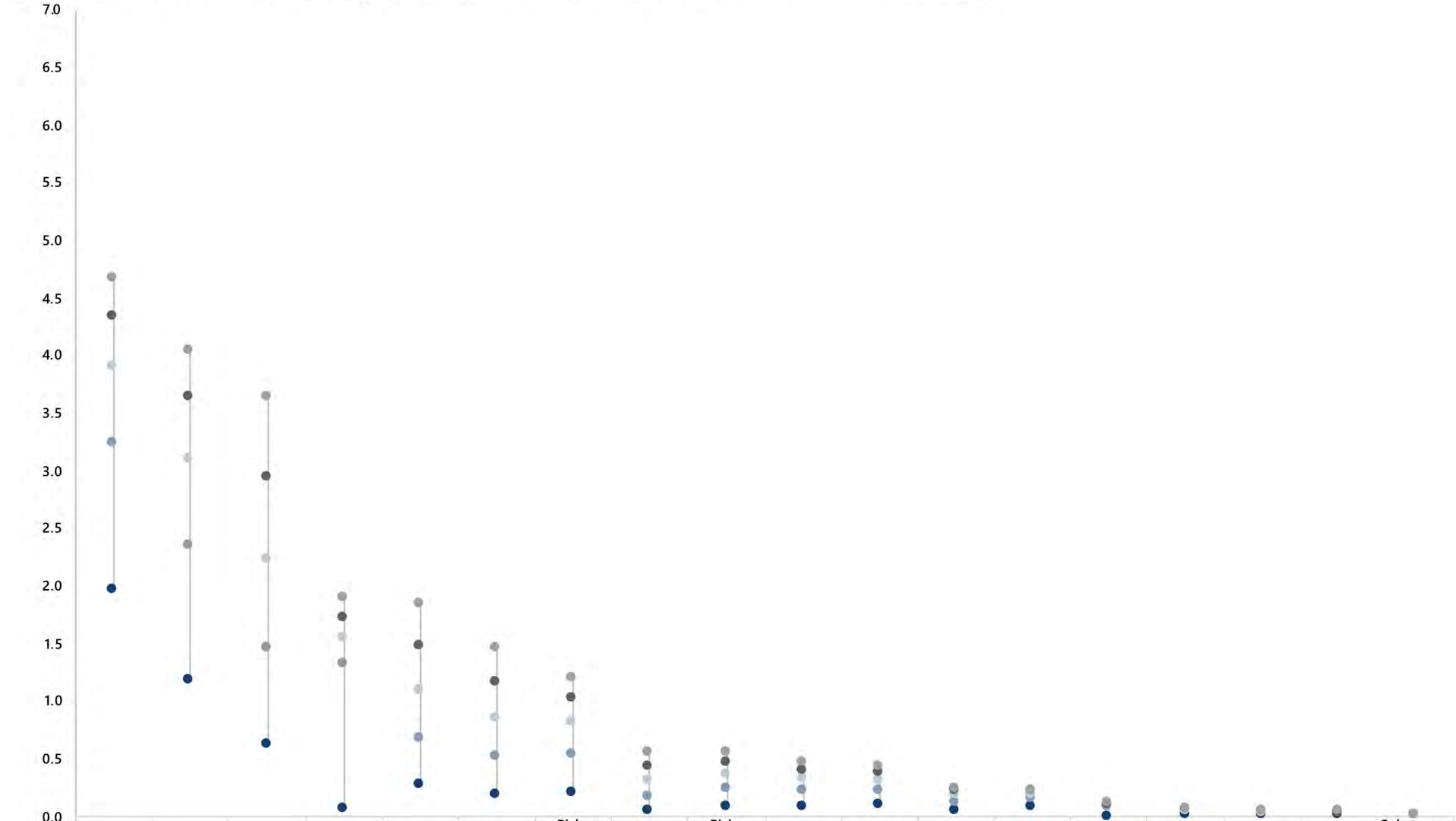
Universal, school-based, social and emotional learning SEL interventions, Learners 12-17 years





N.B: All monetary estimates reflect net present value, ZAR (million)

Figure 5 Benefit-to-Cost Ratios of restored productivity and health to cost by MTEF period over the 15-year scale-up period.



	Perinatal depression	Depression	Childhood Depression	SEL Universal	Epilepsy	Anxiety disorders	Risky Alcohol Use	Childhood Anxiety	Risky Substance Use	Alcohol use disorder	Psychosis	Bipolar disorder	Conduct Disorder	SEL Indicated	Idiopathic ID	ADHD	Dementia	Substance-use disorder
MTEF 1	1.97	1.18	0.63	0.07	0.27	0.18	0.21	0.06	0.09	0.09	0.11	0.05	0.09	0.00	0.02	0.02	0.01	0.01
MTEF 2	3.24	2.36	1.47	1.32	0.69	0.51	0.55	0.18	0.24	0.22	0.22	0.13	0.16	0.08	0.04	0.03	0.03	0.01
MTEF 3	3.91	3.11	2.22	1.55	1.09	0.85	0.82	0.31	0.37	0.32	0.31	0.19	0.20	0.09	0.06	0.04	0.03	0.02
MTEF 4	4.35	3.64	2.95	1.73	1.48	1.17	1.03	0.44	0.47	0.40	0.38	0.22	0.22	0.11	0.07	0.05	0.04	0.02
MTEF 5	4.68	4.04	3.64	1.89	1.84	1.47	1.21	0.56	0.55	0.47	0.43	0.25	0.23	0.12	0.07	0.05	0.05	0.02

Service Redistribution and Efficiency Gains

Figure 6 reflects the redistribution of services achieved through the 15-year scale-up period, illustrative of the improved efficiency in service delivery achievable. As outlined in detail in the methodology and technical appendices of this Report, a gradual transition to the primary health care level for outpatient services was modelled (up to a maximum of 80% of outpatient care) for most disorders, excepting the withdrawal and relapse prevention service for both alcohol- and substance-use disorders, delivered at the hospital levels. Concurrently increased service provision for acute inpatient stays were modelled equally for the district and regional hospitals; allowing for longer-term stays to be distributed across the higher hospital levels, accounting for the maximum hospital bed capacity for the tertiary, central and psychiatric hospitals which currently exist in the country.

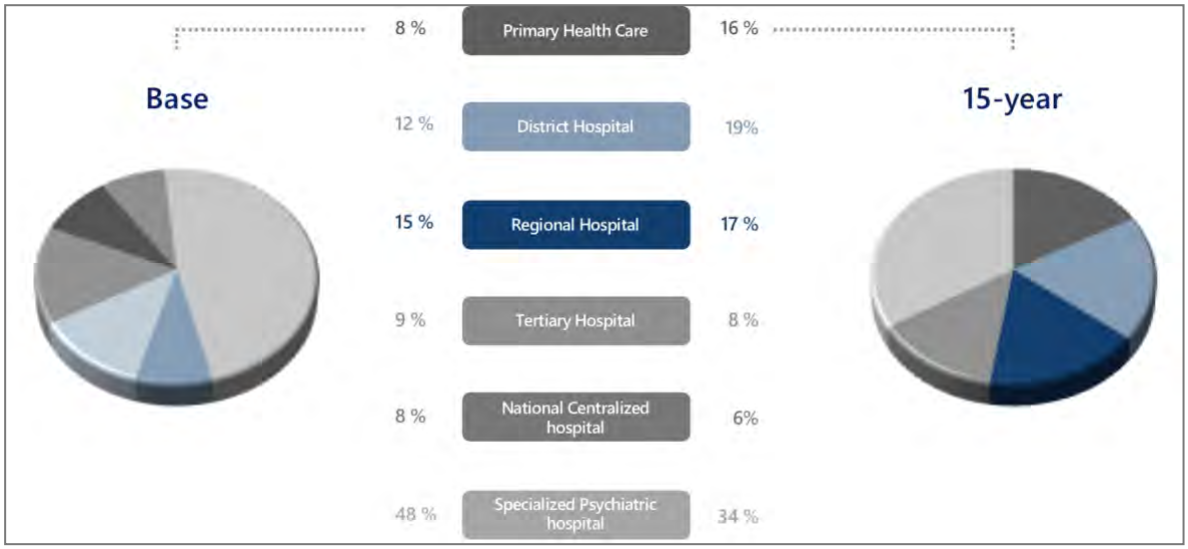
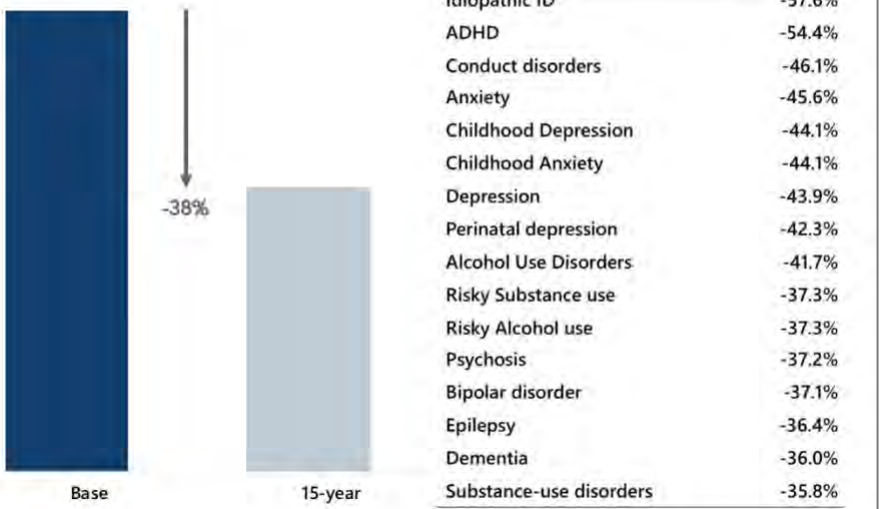


Figure 6 Redistribution of services over time

Based on our existing service delivery environment for mental health care, specialized psychiatric hospital services reduce from providing a total of 48% of overall mental health services to 34%, with primary health care, district hospital and regional hospital services increasing from accounting for 8%, 12% and 15% of mental health service provision at baseline, respectively, to 16%, 19% and 17% of service provision for mental health services by the end of the 15-year period.

Figure 7 depicts the change in the annual health care costs per average case treated between year one and year 15 (present value). As illustrated, across all conditions, the average cost of health care services is reduced by close to 40%, with reductions in the average cost of treatment ranging from 36% for epilepsy, dementia, and substance-use disorder to as high

as 57% for Idiopathic Intellectual Disability. It is important to note that this reduction in health care costs for ID (and other severe MNS disorders) does not account for the significant expansion of community-based day and residential services that are modelled in this Investment Case; these findings do however illustrate that these savings can be harnessed to finance the operational costs of these new community-service platforms. Average cost reductions for the treatment of common mental disorders including anxiety and depression are approximately 45%.



Target Population	% Reduction
Idiopathic ID	-57.6%
ADHD	-54.4%
Conduct disorders	-46.1%
Anxiety	-45.6%
Childhood Depression	-44.1%
Childhood Anxiety	-44.1%
Depression	-43.9%
Perinatal depression	-42.3%
Alcohol Use Disorders	-41.7%
Risky Substance use	-37.3%
Risky Alcohol use	-37.3%
Psychosis	-37.2%
Bipolar disorder	-37.1%
Epilepsy	-36.4%
Dementia	-36.0%
Substance-use disorders	-35.8%

Figure 7 Change in annual health care costs per average case treated over time

12.
The Price of Inaction

Lost Number of Working Days due to Illness and Premature Mortality

As outlined in the methodology, productivity losses are assessed both with respect to whole days out of role/off work (absenteeism) and partial days of impaired activity while at work (presenteeism). These are attributed both through illness and premature mortality amongst our target populations. Estimated lost days of work on account of different disorders are outlined in the methodology and formed the basis of this analysis. Childhood developmental and behavioural disorders (ADHD and conduct disorder), as well as dementia, are not included as it is assumed that no direct mortality results from these conditions and they are not assumed to be active in the workforce. For childhood depression, lost workdays are estimated based on premature mortality only. No other estimates of lost workdays are calculated for children (i.e., through absenteeism and presenteeism) as it is assumed that they are not part active in the workforce. Furthermore, data relating to lost working days due to several conditions, including psychosis and epilepsy, are not available and as such, these estimates are likely an underestimate.

Figure 8 outlines the total current estimated lost workdays due to illness and premature mortality on account of the burden of MNS disorders in South Africa for the scale-up period. In total, estimated losses in workdays over the scale-up period, accounting for 250 working days, an

unemployment rate of 28.7% and a labour force participation rate of 50.5%, amounts to approximately 1.05 billion working days.

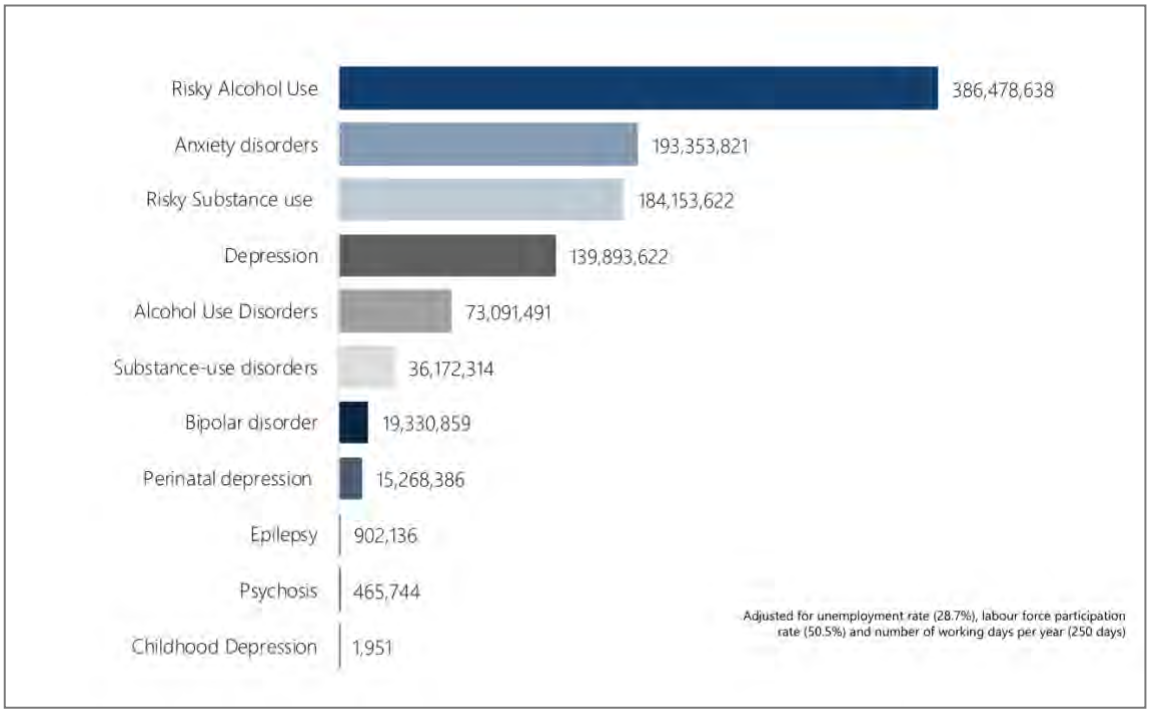


Figure 8 Lost Number of Working Days due to Illness and Premature Mortality over the scale-up period

Economic Value of Lost Productivity

After accounting for labour participation, unemployment, and total workdays available, it is estimated that over the scale-up period, the economic value of lost days of production amounts to ZAR 2.4 trillion (ZAR 1.9 trillion net present value (NPV)) (Table 22). When expressed as an annual amount, lost workforce productivity amounts to ZAR 161 billion, per year; or approximately 4% of the country's GDP. The combined economic value of this lost productivity greatly exceeds the estimated cost of current mental health expenditure and those projected for service scale-up of ZAR 326.6 billion (209.0 NPV), excluding infrastructure, over the 15-year scale-up period. With regards to common mental disorders (depression and anxiety including peri-natal depression), the economic value of lost productivity amounts to approximately ZAR 802 billion, whilst risky alcohol and substance-use, in addition to alcohol- and substance-use disorders amounts to ZAR 1.6 trillion over the next 15-years, without intervention.

Table 22 Economic Value of Lost Productivity due to Illness and Premature Mortality over 15-years, without action

Disorder/Condition	Value of Lost Productivity; ZAR, millions
Risky Alcohol Use	889,906
Risky Substance use	424,032
Alcohol Use Disorders	168,300
Anxiety disorders	445,216
Bipolar disorder	44,511
Depression	322,119
Childhood Depression	4
Epilepsy	2,077
Perinatal depression	35,157
Psychosis	1,072
Substance-use disorders	83,290
Total	2,415,686 (1,914,599 NPV)

When placed in context, particularly against the value of improved health, restored economic productivity and health care savings accrued from investing and scaling up mental health services, the scale of economic losses due to unaddressed mental well-being is indisputable (Figure 9). Throughout the five hypothetical MTEF periods of the 15-year scale-up, the cost of inaction increases from ZAR 460 billion to ZAR 503 billion (per period), an immense loss especially when considering these analyses were conservative and likely underestimated.

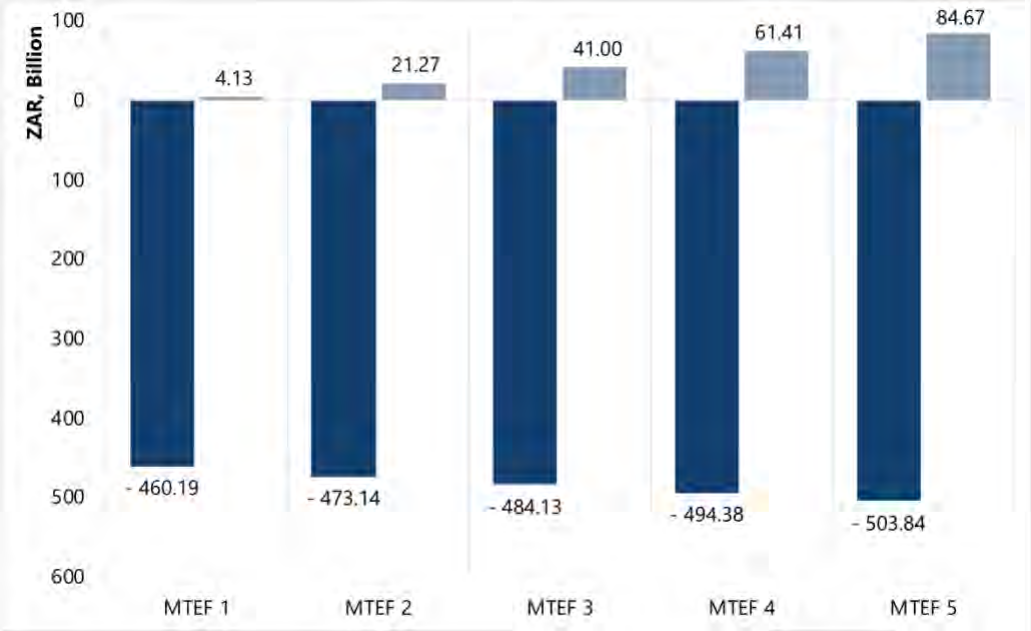


Figure 9 Economic Value of Inaction compared to the Economic Value of Investment

PART D

ACHIEVING A SUSTAINED AND INTEGRATED RESPONSE

Health system strengthening (HSS) has been recognized as a critical component of global public health and international development, with widespread consensus that alongside increased investments in health care interventions and services, there is a need for complimentary investments in the broader health system components on which successful implementation and uptake of evidence-based interventions into routine practice is dependent [72]. Undoubtedly, the return-on-investment analyses presented herein provides a robust and critical method with which to guide the effective prioritization of and advocacy for improved resourcing for mental health. However, equally critical is the need to account for the resources that will be needed to ensure the successful implementation of these interventions [73].

Many investment cases and economic evaluations, both for mental health and other health priorities, have failed to account for the costs associated with implementation, leading to an underestimation of what is really needed to achieve the social and economic returns demonstrated through modelling approaches [74]. In this section of the Report, with a view to improving planning for service change, we provide a candid review of the full range of costs and actions required for the successful implementation of the intervention packages modelled in this Investment Case. We enumerate the investments needed for capital infrastructure, governance structures, planned interfacility patient transport, primary health care provider training and supervision mechanisms and health promotion efforts. There were agreed to be essential, by expert consensus, provincial and National stakeholders' consultations, the recommendations of the Human Rights Commission, and current national Mental Health Policy [3, 75]. Given the extensive efforts and consultations that have taken place in order to generate these estimates, we outline in detail many of the assumptions and data sources that have underlined our calculations, to enable both the consideration of alternative scenarios for implementation and to ensure full transparency.

All cost analyses were conducted from the provider perspective and are expressed in 2020 South African Rands, real terms, unless expressly outlined as Net Present Value estimates. In these instances, we have applied a 3% discount rate to the cost value. Total cumulative investments over the scale-up period are reported, in addition to annual appropriations for the first Medium Term Expenditure Framework period (year 1 to year 3) with estimates of annual year-on-year growth rates outlined per MTEF period over the 15-year scale-up period, and total estimated appropriations per MTEF period also outlined.

13.

Costing a Community-based Residential- & Day-care Service Platform

It would be remiss to overlook the urgent need to address the community-based service needs of people living with mental disorders in South Africa. Whilst all service needs associated with the community-based residential- and day-care service platform, as outlined in this sub-section, have been included in the ROI analyses for the specific populations assumed in need (reported in the preceding sections of this report), we present here, an itemized and detailed account of the specific service components, in addition to an appraisal of the capital instrastructural investments necessary to support such a platform.

From the outset, it is important to acknowledge that a wide array of services and support systems are crucial. Beyond this, such services must be flexible to the nature and severity of disabling events experienced by individuals and, consequently, the scope of intervention that may or may not be needed to comprehensively restore and/or maximize the

capabilities of those affected to participate in their communities and derive meaningful enjoyment throughout their lifecycle. The specification of a proposed model for a community-based day- and residential-service platform, and the identification and quantification of the investments needed to support its achievement, has been guided by the National Mental Health Policy Framework and Strategic Plan 2013-2020 [75] and modelled taking into consideration the critical mass of expertise and experience in mental health care in South Africa across research leaders, service-user organizations, civil society and Government Departments, whose perspectives and previous efforts have enabled the assessment presented herein.

In particular, we note the excellent track record and varied roles played by the NGO sector, particularly the South African Federation for Mental Health and its affiliates, and the South African Depression and Anxiety Group (SADAG) both through functions that substitute and/or complement state service delivery and the community-level for mental health. Whilst our mandate did not make provisions for the acquisition and assessment of a wide array of data sources needed to determine a comprehensive platform of community-based residential and day-care services; the following empirical analyses can be used to advocate for the expansion of support to the NGO-sector, whilst demonstrating avenues for collaboration and complementary action from the Government, led by the Department(s) of Health and Social Development in collaboration with numerous Departments.

The development and subsequent costing of an integrated platform for Community-based Residential- and Day-care services aims to lay the foundation for the introduction of an intersectoral, evidence-based, contextually relevant, person-centred, collaborative, and cost-effective service package as a fundamental component of our mental health response. The conceptualization of this platform is also intended to enable a supported transition for individuals who have lived in institutionalized settings for long periods of their lives. With this in mind, adequate attention has also been paid to the fiscal implications of establishing this service, such that task-shifted support and a gradual scale-up of services has been prioritized, where possible, and in consultation with clinical specialists, only the fundamental components of such a model have been prioritized for the medium-term.

The model adopts the notion of disability-inclusive development and proposes a rehabilitation framework, drawing heavily on the use of occupational therapy as a fundamental component of community mental health service delivery. Occupational therapy has a distinct value in both mental health promotion and prevention, and in the holistic delivery of more intensive interventions across the lifespan. This is particularly due to its' emphasis on enabling meaningful occupation to promote increased participation in education, play, leisure, work, and other activities associated with daily living and social involvement within a variety of

"…on the other hand OT's … sit with so much expertise but they are not utilized in primary health care...I'm talking about far-fetched areas, 800 kilometres from here, auxiliary services [are] non-existent…"

Multisectoral Provincial Workshop Participant, 2019-20

"Where are your social workers, occupational therapists and all the other professions? Mental health is about a multidisciplinary approach and all the pressure cannot be laid on a professional nurse at a primary health care clinic.

Multisectoral Provincial Workshop Participant, 2019-20

environments, including schools, the home, community, work, residential, and health care settings [76]. Occupational therapists have a range of unique expertise in the areas of occupational performance, activity analyses and design, environmental analyses, neurophysiology, psychosocial development, and group dynamics. A growing body of evidence has demonstrated that promoting increased participation of individuals in meaningful occupation has translated into improved positive emotions, resilience building and improved mental health and well-being [77]. Occupational therapy has also been found to be cost-effective to support individuals living with severe mental health in the community [78]. Occupational therapists can provide the skills training that individuals who have lived in institutionalized settings need to re-establish daily routines, manage and monitor health conditions, develop new roles, and participate meaningfully in the communities. Occupational therapy lifestyle interventions have been found to lead to significant improvements in mental health and social functioning whilst decreasing depressive symptoms [79], translating to health savings that far exceed the cost of intervention [80].

The core service package of community-based mental health services modelled in this analysis can be broadly characterized to include i) residential and day-care services, in collaboration with the Department of Social Development and NGOs; ii) psychosocial services provided by occupational therapist assistants and occupational therapists as well as social workers, iii) mental health literacy and self-care, iv) medication adherence support and pharmaceutical management support, and v) capital investments in special housing through the Department of Human Settlements and capital investments in day-care infrastructure through the Department of Health.

The provision of community-based residential and day-care services have been modelled for a subset of individuals living with psychosis, bipolar disorder, dementia, and idiopathic developmental intellectual disability (ID). Assumptions used to calculate the "in-house" service costs for day- and residential- services, including total Full-Time Equivalent staffing ratios per 30-person service, per year; proportions of each target population assumed to require each service, as well as the value of the per diem subsidy assumed per person, per service, are summarized in Figure 10, for day-care services, and in Figure 11 for residential services. The cost analysis assumes coverage of both services in the base year as 2% of those in need, with target coverage set at 50%, by the end of the 15-year period, for both day and residential services. It is however noted that scale-up may be delayed until sufficient planning can take place to ensure that adequate infrastructure is in place (discussed in detail in section 14, *Enhancing* Infrastructure, page 99) and summarized in the results of this section. The proportions of those requiring these community services (also

Community-based Day-care Service

Modelled Service & People in Need

Target Population	Proportion Requiring Day-care Services
Bipolar disorder, 15+ years	7.5%
Psychosis, 15+ years	7.5%
Dementia, 40+ years	10%
Idiopathic developmental intellectual disability, 1+ years	20%

All day-care clients are provided with 100 days of day-care per year. Rehabilitative services are delivered by a full-time Occupational Therapist Assistant to 30 users per facility. The OTAs receive monthly support from an Occupational Therapist who will visit once a month for half a day to co-develop recovery/rehab orientated interventions which are crafted for each individual. A full-time social worker manager is also provided per day-care facility. NB: Health care and medication costs are subsumed within the cost-of-treatment modelled through the treatment and rehabilitative interventions

Staff Composition and Cost Assumptions

Staff Cadre	Cost of Employment (ZAR, Net Present Value)	Full Time Equivalent Ratio per 30 person service per year
Social Worker Manager (grade 2)	377,341	0.74
Occupational Therapist Assistant (grade 2)	200,505	0.74
Occupational Therapist (grade 2)	377,341	0.012

Target Population	Value of per diem overhead unit cost
Bipolar disorder, 15+ years	ZAR 73
Psychosis, 15+ years	ZAR 73
Dementia, 40+ years	ZAR 73
Idiopathic ID, 1+ years	ZAR 73

A per diem "overhead" unit cost is then added for each day-care client receiving care per year, calculated as the monthly day-care subsidy paid by each province for the different categories of mental health clients divided by 20 days, then multiplied by the frequency of days attended (i.e. 100 days per year per person in need)

Figure 10 Community-based Day-care Service: Target Population, Staffing and Cost Assumptions

Community-based Residential Service

Modelled Service & People in Need

Target Population	Proportion Requiring Residential services
Bipolar disorder, 15+ years	2.5%
Psychosis, 15+ years	2.5%
Dementia, 40+ years	10%
Idiopathic developmental intellectual disability, 1+ years	3.6%

All residents are provided with 365 inpatient days in a community residential facility per year. Rehabilitative services are delivered by a full-time Occupational Therapist Assistant to 30 residents per facility. The OTAs will receive weekly support from an Occupational Therapist who will visit once a week for half a day to co-develop recovery/rehab orientated interventions which are crafted for each individual. A full-time social worker manager is also provided. A Professional Nurse will visit each facility once a month to provide medication management and support to residents and staff, spending an average of 15 minutes per person per residential facility. NB: Health care and medication costs are subsumed within the cost-of-treatment modelled through the treatment and rehabilitative interventions

Staff Composition and Cost Assumptions

Staff Cadre	Cost of Employment (ZAR, Net Present Value)	Full Time Equivalent Ratio per 30 person service per year
Social Worker Manager (grade 2)	377,341	2.85
Occupational Therapist Assistant (grade 2)	200,505	2.85
Occupational Therapist (grade 2)	377,341	0.19
Professional nurse (grade 2)	424,467	0.084

Target Population	Value of per diem accommodation unit cost
Bipolar disorder, 15+ years	ZAR 106
Psychosis, 15+ years	ZAR 106
Dementia, 40+ years	ZAR 159
Idiopathic ID, 1+ years	ZAR 159

A per diem "accommodation" unit cost is then added for each resident receiving care per year, calculated as the monthly subsidy paid by each province for the different categories of residents divided by 30 days, then multiplied by the length of stay (i.e. 365 days)

Figure 11 Community-based Residential Service: Target Population, Staffing and Cost Assumptions

detailed in Appendix D) were identified based on WHO recommendations and further adapted through technical consultations. Whilst no recommendations through WHO guidance have been provided for day and residential needs for ID, technical experts have recommended 20% of cases of people living with mild idiopathic intellectual disability (ID) receive day-care services. Residential services are modelled for 20% of those assumed to be living with moderate to severe ID; based on a study from the Western Cape, approximately 18% of all cases of ID are assumed to be moderate-severe [71].

In support of patient rehabilitation, both residential and day-care facilities are provided with a full-time occupational therapist assistant (OTA), with weekly and monthly support provided to OTAs by an occupational therapist (OT) working in the residential and day-care centres respectively, to co-develop recovery/rehab orientated interventions, crafted for each individual. Both day-care and residential centres are also provided with a full-time social worker manager to oversee the facility and ensure that those accessing these services have sufficient support to access social grants and other services. A monthly visit by a professional nurse (PN) is modelled for those accessing residential-care services to support with medication delivery, pharmaceutical management for the facility and adherence, spending an average of 15 minutes per resident, per month. The PN can also address any physical needs of residents or, facilitate referrals when additional health care consultations may be indicated. It is acknowledged that a broader staff and service complement is needed to provide holistic rehabilitation services including physiotherapists, speech therapists and vocational counsellors, however, in the interest of priority setting, these staff have not yet been modelled for community-based services as exact needs have not yet been determined.

Estimated numbers of people reached through community-based day- and residential services per year for the first MTEF period (year one to three) and total estimates per MTEF period over the 15-year scale-up period are summarized in Table 23. By scaling up coverage of day- and residential- services from a baseline of 2% to 50% by the final year of the 15-year period, 148,505 and 53,705 people would have received day- and residential-care services, respectively. Whilst the distributions of people reached by target population change only modestly throughout this period (Table 24), the annual number of people reached through day-care services increases from 258 in year one to 25,655 in year 15. Similarly, the annual number of people reached through residential-care services increases from 94 in year one to 9,386 in year 15.

The total appropriation estimates for each MTEF period over the 15-year scale-up are outlined in Table 25. These costs reflect the "in-house" service costs only, inclusive of the staffing and overhead costs associated with delivering these services. The first MTEF period (year one to three), accounts for 9% of the total cumulative 15-year investment for both day- and residential services, which increase to 32% of the investment being

Table 23 Medium Term Estimates of People Reached through Community-based Day- and Residential Services per Year and Total Estimates per MTEF period over 15-years

	Annual Community-based Day- and Residential Service Needs Medium Term Estimates of People Reached			Annual Community-based Day- and Residential Service Needs per MTEF period over 15-year scale-up					Total People Reached through Community-based Day- and Residential Services over 15-year scale-up
Service Platform	**Year 1**	**Year 2**	**Year 3**	**Year 1-3**	**Year 4-6**	**Year 7-9**	**Year 10-12**	**Year 12-15**	
Community-based Day-Care	258	816	1,558	2,632	11,087	24,527	42,719	67,540	148,505
Community-based Residential Care	94	295	559	949	3,959	8,771	15,408	24,617	53,705

Table 24 Distributions of Target Populations Reached and Total People Reached Per Year through Community-based Day- and Residential Services in Year 1 vs Year 15

	Community-based Day-Care		Community-based Residential Care	
Distribution of Person(s) Reached per Year by Diagnosis	**Year 1**	**Year 15**	**Year 1**	**Year 15**
Psychosis	19%	15%	17%	13%
Bipolar Disorder	43%	28%	39%	25%
Idiopathic developmental ID	30%	46%	15%	22%
Dementia	9%	12%	29%	39%
Total Person(s) Reached per Year	**258**	**25,655**	**94**	**9,386**

Table 25 Total Investment in Community-based Day- and Residential Services per MTEF period over 15-year Scale-up.

	Community-based Appropriation Estimates per MTEF period over 15-year scale-up ZAR, million % of 15-year total					Cumulative 15-year Community-based Service Platform Investment ZAR, million
Service Platform	**Year 1-3**	**Year 4-6**	**Year 7-9**	**Year 10-12**	**Year 12-15**	
Community-based Residential Care	148.25	230.12	316.55	404.59	510.42	**1,609.92**
	9%	14%	20%	25%	32 %	
Community-based Day-Care	63.00	97.79	134.52	171.94	216.91	**684.16**
	9%	14%	20%	25%	32%	
Total	**211.24**	**327.91**	**451.07**	**576.53**	**727.33**	**2,294.08**
	9%	**14%**	**20%**	**25%**	**32%**	

allocated for years 12 to 15, as coverage expands and increased people in need are reached. Residential service appropriations increase from a total of ZAR 148.3 million during years one to three, to ZAR 510.4 million during the final three years of the scale-up period. Similarly, day-care service appropriations increase from ZAR 63.0 million in the first MTEF period, to ZAR 2,167.0 million in the final MTEF period of the 15-year scale-up. Notably, these service costs do not account for the health services received by residents and day-care clients (also already enumerated through the model of treatment and rehabilitative interventions and reported on in Part C (page 51), as well as the infrastructure and planned patient transport needs that must accompany this investment. To provide a comprehensive overview of all cost components needed to establish a Community-based Day- and Residential- Service Platform, Table 26 attempts to outline the fundamental investments needed to establish this service, including the in-house services already reported. These additional costs relate to the required infrastructure development, investments already enumerated (and reported) for the PHC-level health care service needs of those receiving residential services and planned interfacility patient transport delivered by EMS. Further, where possible, all costs are disaggregated according to the presumed mandate of each Department. For example, subsidies allocated for day-care users with mild ID are provided for by the Department of Social Development – and as such, these cost components of the "in-house" day-care service are reported separately to the subsidies (i.e. "overhead" component of the day-care service) for the remaining target populations.

Evidently, the largest costs enumerated are driven by the need for capital investments in infrastructure – where it is assumed that the Department of Health bares the costs of the establishment of day-care facilities and the Department of Human Settlements bares the costs of the establishment of residential facilities (outlined in detail in the subsequent section of this Report:
Enhancing Infrastructure, page 99). In order to achieve the coverage targets set, a total of 1,790 30-bed Residential Facilities must be in place or established, with 342 Day-care Centres similarly being required – over the 15-year period.

Nonetheless, it bears mentioning that these investments are modest when compared to the potential medico-legal claims that that may be encountered in the absence of intervention. Based on the anticipated needs of residential services, and the value of the Life Esidimeni Arbitration Award; the total investment in community-based service provision inclusive of capital and recurrent expenditure represents 38% of the potential medico-legal claims that could be realized.

Based on the phase one inquiry into the costs of mental health care in South Africa, whilst not comprehensively reported across all Provinces, estimated expenditure by the Department of Health on NGO mental health services amounted to approximately ZAR 250 million in the 2016/17 financial year. Service provision remains disorganised and lacking in the necessary rehabilitation and support staff required to ensure humane care. Furthermore, a large majority of day and residential services currently being funded cater for individuals with physical disabilities.

Table 26 A Comprehensive Overview of all Cost Components Needed to Establish a Community-based Day- and Residential- Service Platform per MTEF period over 15-years

	Community-based Service Appropriation Estimates per MTEF period over 15-year scale-up ZAR, million % of 15-year total					**Cumulative 15-year Community-based Service Platform Investment** ZAR, million
Cost components: Community-based Service	**Year 1-3**	**Year 4-6**	**Year 7-9**	**Year 10-12**	**Year 12-15**	
Community-based Day-Care						
"In-house" Day-care Service Costs borne by the Department of Health	52.40	219.48	481.20	831.54	1,312.65	2,897.26
	1.8%	7.6%	16.6%	28.7%	45.3%	
"In-house" Day-care Service Costs borne by the Department of Social Development (i.e. cost of per-diems for mild ID)	6.59	31.64	75.62	139.29	223.17	476.32
	1.4%	6.6%	15.9%	29.2%	46.9%	
Community-based Day-care Infrastructure Investments	74.78	163.39	230.62	332.56	430.07	1,231.43
	6.1%	13.3%	18.7%	27.0%	34.9%	
Community-based Residential Care						
"In-house" Residential Service Costs borne by the Department of Health	101.00	428.34	956.79	1,692.13	2,711.70	5,889.96
	2%	7%	16%	29%	46%	
Costs enumerated for the PHC-level health care service needs of Residents	11.06	39.07	86.75	155.02	246.48	538.38
	2%	7%	16%	29%	46%	
Costs enumerated for Planned Patient Transport delivered by EMS for Inter-facility Transfers for Residents	2.87	11.81	25.93	45.29	72.06	157.96
	1.8%	7.5%	16.4%	28.7%	45.6%	
Community-based Residential Infrastructure Investments borne by the Department of Human Settlements	237.23	989.84	2,192.83	3,852.02	6,154.25	13,426.17
	1.8%	7.4%	16.3%	28.7%	45.8%	
Total Investments by Sector						
Total Community-based Service Investments: Department of Health	242.11	862.09	1781.29	3056.54	4,772.96	10,714.99
Total Community-based Service Investments: Department of Social Development	6.59	31.64	75.62	139.29	223.17	476.32
Total Community-based Service Investments: Department of Human Settlements	237.23	989.84	2,192.83	3,852.02	6,154.25	13,426.17
Estimating the Price of Inaction						
Cost of potential medico-legal claims	1,138.68	4,751.23	10,525.59	18,489.71	29,540.42	64,445.63

14.
Enhancing Infrastructure

The analysis of infrastructure needs has been based on the existing number of dedicated mental health or psychiatric beds available at each level of the health system, and the normative assumptions for the length of stay and proportions requiring inpatient care for each intervention package and target population, per year, as outlined in our intervention assumptions (Appendix A) and prevalence rates. We also account for a gradual and rational redistribution of inpatient care for mental health services over time, as outlined in the methodology of this report (and further detailed in Appendix C).

> ***"...they complained about the way they were put in one space because they abscond, they fight...we have to tie them to their beds...we don't have place...even if Esidimeni come[s] here, we'll just accept because we don't know what to do anymore..."***
>
> *Multisectoral Provincial Workshop Participant, 2019-20*

Due to data limitations regarding the availability of fit-for-purpose inpatient psychiatric units in designated District and Regional hospitals, infrastructure costs reported for these levels do not include the costs associated with upgrading existing infrastructure. Further, because of the absence of country-wide data regarding the number of beds available for community-based residential care and the existing capacity of day-care facilities for mental health, infrastructure costs reported for these levels assume that at baseline, this infrastructure is not in place.

It is also assumed that those currently receiving community residential services will remain in these facilities for their lifetime (or, for the purposes of this Investment Case, for a 15-year period at minimum). Therefore, additional beds will be required to accommodate increased patient coverage within the 15-year modelled period of scale-up. Comprehensive data on the current average age of those living in residential facilities and the average life expectancy of these populations in South Africa would be required to estimate when the beds dedicated for their use would become available again. Finally, whilst inpatient needs for substance-abuse treatment have been modelled to be delivered through hospital inpatient services (scenario one), we have additionally estimated the costs associated with establishing state-funded substance-abuse treatment centres, as an alternative scenario (scenario two), considering those already established (excluding non-state funded substance abuse centres e.g., those provided by NGOs and the private sector).

> ***"…for example they use substances and become psychotic, we do medical withdrawal…and then we have to discharge…there is a rehab facility…the waiting list is over a year to get a spot…when you discharge, they go back to doing drugs, become psychotic, re-admit which makes this a***
>
> *Multisectoral Provincial Workshop Participant, 2019-20*

In this second scenario, substance-use related inpatient care for those living with substance-use disorders modelled to receive long-term inpatient care at the Tertiary and Central Hospital levels are shifted to receive this care through substance-abuse treatment centres. The beds at the tertiary and centralized levels in this alternative scenario are specified separately (scenario two).

All estimates of capital infrastructural investments required per year consider the infrastructure that has been established in previous years. Unit cost and capacity estimates for attaching inpatient psychiatric units for all hospital levels were sourced from the National Department of Health Infrastructure Unit. For Substance-abuse Treatment Centres and Community-based Residential centres, unit cost and capacity estimates were sourced from the National Department of Human Settlements and exclude any associated land lease costs. For Community-based Day-care centres, unit cost and capacity estimates were estimated based on a Western Cape Government initiative and adjusted to reflect real 2020 costs and assumed capacity of 30 users per facility [81]. Existing bed capacity for each inpatient unit or facility type, unit costs of establishing each inpatient unit or facility, and the capacity assumed for each new unit or facility is summarized in Table 27.

Table 27 Existing Capacity, Unit Costs and Assumptions for Capital Infrastructure

Facility Type	Existing Beds or Capacity assumed	Infrastructure cost per Unit (ZAR)	Beds/Capacity per Unit
District Hospital	246	75,123,414	25
Regional Hospital	507	171,636,000	60
Tertiary Hospital	263	171,636,000	60
Central Hospital	423	171,636,000	60
Psychiatric Hospital	10,725		
Forensic Assessments	200	208,041,496	40
State patient stay (forensic precinct)	1,595 (all full)	735,949,000	145
Substance-abuse Treatment Centres	576	7,478,209	48
Community-based Day-care Residential Centres		7,500,000	30
Community-based Day-care Centres		33,000,000	30

Table 28 Capital Infrastructure Needs

	Annual Units Needed Medium Term Estimates			Units Needed per MTEF period over 15-year scale-up					Total
Facility Type	**Year 1**	**Year 2**	**Year 3**	**Year 1-3**	**Year 4-6**	**Year 7-9**	**Year 10-12**	**Year 12-15**	
District Hospital Psychiatric Unit	46	14	13	73	32	16	9	1	131
Regional Hospital Psychiatric Unit	4	4	4	12	11	8	18	1	49
Tertiary Hospital Psychiatric Unit									
Scenario 1	1	1	1	4	4	3	3	2	16
Scenario 2	0.7	0.7	0.7	2.2	2.2	1.4	1.8	1.8	9.4
Central Hospital Psychiatric Unit									
Scenario 1						2	3	3	7
Scenario 2						0.4	1	1	2.4
Psychiatric Hospital Psychiatric Unit									
Forensic Assessment Units	2.40	0.09	0.09	3	0.25	0.25	0.25	0.25	4
State Patient Stay Forensic Precinct Unit	19	20	20	59	2	2	2	2	66
Substance-abuse Treatment Centre									
Scenario 2							2	3	5
Community-based Residential Care Facility	3	10	19	32	132	292	514	821	1790
Community-based Day-Care Facility	3	7	10	21	45	64	92	119	342

Where unit numbers are <1.0, a full unit per the estimated number of beds per unit, used for the analysis, is not required.

Table 29 Capital Infrastructure Appropriation Estimates per MTEF period over 15-year Scale-up

	Medium Term Capital Infrastructure Estimates per MTEF period over 15-year scale-up, ZAR, million % of 15-year total					**Cumulative 15-year Capital Infrastructure Investment** ZAR, million
Facility Type	**Year 1-3**	**Year 4-6**	**Year 7-9**	**Year 10-12**	**Year 12-15**	
District Hospital Psychiatric Unit	5,503.51	2,425.01	1,193.13	681.72	46.68	9,850.05
	55.9%	24.6%	12.1%	6.9%	0.5%	
Regional Hospital Psychiatric Unit	1,990.53	1,816.54	1,419.49	3,014.11	166.48	8,407.16
	23.7%	21.6%	16.9%	35.9%	2.0%	
Tertiary Hospital Psychiatric Unit						
Scenario 1	613.18	689.50	466.06	514.87	425.23	2,708.84
	22.6%	25.5%	17.2%	19.0%	15.7%	
Scenario 2	370.15	374.56	248.46	316.77	303.12	1,613.06
	22.9%	23.2%	15.4%	19.6%	18.8%	
Central Hospital Psychiatric Unit						
Scenario 1			338.87	437.04	443.59	1,219.49
			27.8%	35.8%	36.4%	
Scenario 2			69.36	178.59	172.53	420.48
			16.5%	42.5%	41.0%	
Psychiatric Hospital Psychiatric Unit						
Forensic Assessment Units	536.10	51.20	48.89	47.41	46.28	729.88
	73.5%	7.0%	6.7%	6.5%	6.3%	
State Patient Stay Forensic Precinct Unit	43,270.14	1,480.03	1,375.46	1,329.78	1,299.33	48,754.75
	88.8%	3.0%	2.8%	2.7%	2.7%	
Substance-abuse Treatment Centre				13.02	21.41	34.43
Scenario 2				37.8%	62.2%	
Community-based Residential Care Facility	237.23	989.84	2,192.83	3,852.02	6,154.25	13,426.17
	1.8%	7.4%	16.3%	28.7%	45.8%	
Community-based Day-Care Facility	74.78	163.39	230.62	332.56	430.07	1,231.43
	6.1%	13.3%	18.7%	27.0%	34.9%	

In total, over the scale-up period, scenario one determines that the country must establish 131 District Hospital Inpatient Psychiatric units, 49 Regional Hospital Inpatient Psychiatric units, 16 Tertiary Hospital Inpatient Psychiatric units, 7 Central Hospital Inpatient Psychiatric units, 1790 Community residential facilities, 342 Day-care Centres, 4 Forensic Assessment Units and 66 State patient stay (forensic precinct) units (Table 28). Reflecting on the current availability of infrastructure, this estimation translates to establishing Inpatient Psychiatric Units at 52% of District Hospitals, 100% of Regional Hospitals, 84% of Tertiary Hospitals and 78% of Central Hospitals.

Given that investments in Tertiary and Central Hospitals outlined in scenario one has been largely driven by long-stays for a subset of people living with substance-use disorders, scenario two has estimated that the establishment of five substance-abuse treatment centres over the fifteen years of scale-up would reduce the need for infrastructure investments in Tertiary and Central Hospitals – to 49% and 27%, respectively, requiring additional psychiatric units.

By investing in infrastructure for Substance-abuse treatment centres, the estimated saving (through reduced needs at the Tertiary and Central-levels) equates to a total saving of approximately ZAR 1.9 billion in infrastructure (Table 29). The largest cost driver for infrastructure relates to the needs of State Patient Forensic Precinct Units, accounting for ZAR 48 billion over the 15-year period. This is largely due to inpatient stays lasting on average three years (range two to five years) for this group in addition to substantive infrastructure requirements needed to ensure the safety and security of those receiving inpatient care and staff. District and Regional Hospital Inpatient Psychiatric Unit needs over the 15-year period of the scale-up amount to ZAR 9.9 billion and ZAR 8.4 billion, respectively.

Acknowledging that this Investment Case is a national-level exercise, the model has not estimated the need for any additional substance-abuse treatment centres for the first three MTEF periods, based on the total number of state-funded units currently available in the country. It must be noted that the distribution of these centres is highly inequitable across Provinces, with many reporting none in place. As such, Provincial adaptation of these national-level estimates will likely see many Provinces' needing to establish these centres. Similarly, the model has not enumerated the need for any additional Specialized Psychiatric units, based on the total national Specialized Psychiatric Hospital capacity. The establishment of a Specialized Psychiatric hospital will nonetheless be needed for Mpumalanga.

All final capital infrastructure appropriation estimates presented in the consolidation and/or summary of all findings of the Report reflect those associated with scenario two, recognizing the feasibility and significant costs associated with expanding tertiary and central hospital capacity.

15.

Primary Health Care Supervision & Training

Training

> ***"I feel, people when they don't know psychiatry, they are afraid. They are afraid of the patients. They are afraid you know because they don't understand. But once they are trained, they even function better than those who have psychiatry [training]... The nurses who are not psychiatry trained but they got the skills, when you go back to the facilities, they function better. And they treat the patients....some say; "Can we be part of the training because we feel we are being revived?"***
>
> *Multisectoral Provincial Workshop Participant, 2019-20*

Training represents an important and efficient means of utilizing existing healthcare worker resources to expand the coverage of mental health care – as part of an approach referred to as task-sharing or task-shifting, widely evaluated and shown to be effective for mental health care in low- and middle-income countries. The analysis of costs associated with training has focused on the needs of primary health care providers. The number of health providers requiring training at this level were sourced from the NDoH Human Resource Strategic Plan (2019), with the exception of the BPsych counsellor cadre, the distribution and public sector availability of which remains unknown in South Africa. Notably, the 4-year Bachelor of Psychology (BPsych) degree was launched in 2014 to develop

a workforce with which to address the mental health needs of the country at the community level. Graduates (also referred to as Registered Counsellors) are trained to deliver psychosocial support, mental health counselling and psychoeducation, and are recognized by the Health Professions Council of South Africa [82]. The needs of BPsych counsellors were enumerated based on needs and normative assumptions of their time needed for the delivery of specific interventions at the PHC level, primarily related to the provision of psychoeducation. The training needs for Outreach Team leaders (OTLs) were estimated through the normative assumption that each OTL is responsible for managing a team of 10 Community Health Workers (CHWs), and OTLs typically are trained as Enrolled Nurses (ENs).

Preference was given to training strategies already adopted and/or recognized by the National Department of Health. As such, the enumeration of cost estimates has been based on the training programs generated through the following programs:

1. Adult Primary Care / Practical Approach to Care Kit (PACK) Mental health training developed by the Knowledge Translation Unit in collaboration with the NDoH [83, 84]
2. Mental Health Integration Project (MhINT) which has collaborated with the DoH and trained DoH health care providers to deliver integrated mental health care (funded by the CDC)[85].
3. South Africa HIV Addiction Technology Transfer Centre (SA HIV ATTC), a United States President's Emergency Plan for AIDS Relief (PEPFAR) and Substance Abuse and Mental Health Services Administration (SAMHSA) funded centre dedicated to providing training and technical assistance to providers addressing substance use, mental health, and/or HIV throughout South Africa [86, 87]

We also account for specific training required for the delivery of task-shifted support for perinatal mental health problems for Community Health Workers (CHWs) and Outreach Team Leaders (OTLs), developed by the Perinatal Mental Health Project [88]. It is recognized that these training initiatives are not exhaustive; stakeholders from the Department of Health have articulated ongoing training initiatives beyond the primary health care level which focus on professional nurses and doctors working in units designnated to conduct 72-hours assessments and those working in specialized psychiatric hospitals. Further, due to data limitations, we were unable to account for refresher training and specific training materials required for each program. Nonetheless, the provision of trainers and, for all online training programs, the costs associated with data-free access to online training platforms have been outlined. The cost associated with participating in the training is incorporated into the cost-of-employment for all health care providers. The total cost of training over the scale-up period is estimated through the cost of the trainer and the time involved in providing each of the required training modules, assuming a capacity of 25 people per session. Through this approach,

coverage of training for all PHC staff will be reached by the end of the 15-year scale-up period.

This total cost is then divided by the number of years of scale-up to derive an annual cost of training. This cost is then divided by the total number requiring training to derive an average cost per person trained in addition to the average number of people that could be trained per year. Training could likely be planned over shorter periods and offered to larger groups, making room for refresher training to be delivered during this period. For all online training modules, there is no limit on the number that are able to receive training annually, and therefore total PHC staff requiring training are enumerated. The numbers requiring training in Screening, Brief Intervention, and Referral to Treatment (SBIRT) are estimated for medical officers and professional nurses for the PHC level, although no cost is attributed to this, given that these costs are currently borne by the South Africa HIV Addiction Technology Transfer Centre. It is also recognized that all emergency staff across hospital levels will require this training as well, as the intervention is modelled across all levels except for the specialized psychiatric level. Based on the literature, a range of 25-40 participants could be trained per session, typically over two days lasting six hours each [89]. Online training costs are allocated at ZAR 30 per person, based on estimates obtained from the Knowledge Translation Unit (University of Cape Town).

To comprehensively train all primary health care providers to provide integrated mental health care services according to best practice South African models, the total investment over the 15-year scale-up period amounts to a total of ZAR 68.04 million (ZAR 54.16 million net present value) (Table 30). Given the large number of Community Health Workers in the country, the largest training investment is seen for this cadre of health provider. Investments in the training of generalist staff at the PHC level is a paramount enabler to the successful redistribution of services towards primary and community care levels, and the successful delivery of the interventions modelled in this Investment Case. An assessment of the impact of training in the above-mentioned modules at the primary health care level has yielded increasingly positive results [90]. Four facilities in the North West province that have been assessed following the receipt of training reported a significant increase in the identification of depression and alcohol-use disorder (AUD); a comparison of the impact 12-months post-implementation found the detection rates for depression increasing from 5.8% to 16.4% and for AUD from 0% to 13.8% [90]. Furthermore, in the intervention group, 55% of those diagnosed with depression experienced over a 47.9% reduction in PHQ-9 Scores (a screening instrument, diagnosing, monitoring, and measuring the severity of depression), compared to only 30.8% in the control group achieving this reduction in the 12 month follow up period. Remission was also found to be greater in the intervention group (26.9% vs. 16.9%).

Table 30 Total investment required for training of PHC providers per MTEF period over 15-year Scale-up, ZAR million

Target PHC staff and Training Programme	Training Appropriation Estimates per MTEF period over 15-year scale-up ZAR, million					Cumulative 15-year Investment ZAR, million	Number requiring training	Unit cost per person, ZAR	Average number trained per year
Community Health Workers	**Year 1-3**	**Year 4-6**	**Year 7-9**	**Year 10-12**	**Year 12-15**				
Community Mental Health Education Detection CMED training	6.25	6.25	6.25	6.25	6.25	31.25	54,180	614	3,612
Supporting women with perinatal mental health problems	2.47	2.47	2.47	2.47	2.47	12.37	54,180	242	3,612
Outreach team leaders									
Community Mental Health Education Detection CMED training	0.63	0.63	0.63	0.63	0.63	3.13	5,418	614	361
Supporting women with perinatal mental health problems	0.25	0.25	0.25	0.25	0.25	1.24	5,418	242	361
Enrolled Nurse Assistants									
Depression and Adherence Counselling training	0.73	0.73	0.73	0.73	0.73	3.64	6,298	614	420
Brief Mental Health Screening tool	0.04	0.04	0.04	0.04	0.04	0.19	6,298	31	420
Psychoeducational materials training	0.15	0.15	0.15	0.15	0.15	0.73	6,298	123	420
Staff/general nurses									
Depression and Adherence Counselling training	0.81	0.81	0.81	0.81	0.81	4.06	7,022	614	468
Brief Mental Health Screening tool	0.04	0.04	0.04	0.04	0.04	0.21	7,022	31	468
Psychoeducational materials training	0.16	0.16	0.16	0.16	0.16	0.82	7,022	123	468
Professional nurses									
Depression and Adherence Counselling training	1.45	1.45	1.45	1.45	1.45	7.25	12,570	614	838
APC/PACK online self directed-learning	0.07	0.07	0.07	0.07	0.07	0.37	12,570	30	838
APC/PACK online wellness course	0.07	0.07	0.07	0.07	0.07	0.37	12,570	30	838
Screening, Brief Intervention and Referral to Treatment SBIRT, Motivational Interviewing and Problem-Solving Therapy (PEPFAR-funded)							12,570		
Operational managers									
OM Implementation Workshop	0.04	0.04	0.04	0.04	0.04	0.20	0.04	61	231
Training in CQI	0.15	0.15	0.15	0.15	0.15	0.73	0.15	221	231
Medical Officers									
Doctors' Mental Health Course: Online CPD accredited course	0.01	0.01	0.01	0.01	0.01	0.03	939	30	63
Screening, Brief Intervention and Referral to Treatment SBIRT, Motivational Interviewing and Problem-Solving Therapy (PEPFAR-funded)							939		63
B-Psych Counsellors									
Trainer supervisor	0.34	0.34	0.34	0.34	0.34	1.68	2111	842	141
Psychologists									
Master Trainer	0.01	0.01	0.01	0.01	0.01	0.07	69	842	5
Total	**13.61**	**13.61**	**13.61**	**13.61**	**13.61**	**68.04**			

District Mental Health Teams

As outlined in the methodology, the cost of these District Mental Health Teams (recommended by the National Mental Health Policy Framework, 2013-2020) is subsumed within the cost-of-service delivery at the primary health care level (Appendix A). For our analysis, these teams are assumed to form part of the district hospital staffing complement, with 80% of their time enumerated for dedicated supervision and support of primary health care providers, primarily for complex case management. Assumptions regarding the proportion of complex cases requiring supervision support at the PHC level are summarized in Table 31.

Table 31 Proportion of Target Population(s) assumed to be Complex, for which DMHT support is required

Target Population	Proportion complex
Anxiety disorders, 15+ years	2%
Depression, 15+ years	2%
Perinatal depression, 15 – 49 years	10%
Psychosis, 15+ years	15%
Bipolar disorder, 15+ years	15%
Epilepsy, 1+ years	0%
Idiopathic developmental intellectual disability, 1+ years (for intensive psychosocial treatment)	60%
Conduct disorder, 5-19 years	0%
ADHD, 5-19 years (for methylphenidate medication)	30%
Dementia, 40+ years	0%
Alcohol use disorder, 15+ years	0%
Substance-use disorder, 15+ years	0%
Risky Alcohol use, 15+ years	0%
Risky Substance use, 15+ years	0%

It is acknowledged that district hospitals are also challenged with shortages of personnel, including mental health specialist input, and this supervisory role may be distributed across all district hospitals within each province so that the responsibility for this role is not borne by one set of staff from one hospital. Furthermore, distributing this role across each Province's District hospitals allows for relationship building between the District hospitals and the primary health care facilities to which patients are discharged for ongoing care. The annual cost of 52 DHMTs and assumptions regarding their composition are summarized in Table 32.

Table 32 Assumptions for Estimating the Costs and Structure of District Mental Health Teams

Staff Cadre	Cost of Employment	Cost of 80% of time spent on supervision	Cost of 52 teams providing supervision
Psychiatrist: grade 2	1,366,914	1,093,531	56,863,614
Psychologist: grade 2	837,178	669,743	34,826,625
Occupational therapist: grade 2	377,341	301,872	15,697,366
Social worker (supervisor): grade 2	377,341	301,872	15,697,366
Psychiatric nurse (grade 2)	660,081	528,065	27,459,382
Admin officer	166,117	132,893	6,910,456
Total Cost for 52 DMHTs per year*			157,454,809
*These costs are provided for reference purposes only; all costs associated with DMHT supervision have been accounted for in the Costs of Service Scale-up, page 54; all costs reported as ZAR Net Present Value			

16. Governance

Provincial Mental Health Directorates

> *"Remember the directorate should inform the structures within the district so if you don't have the structure at the provincial level how do we establish the structure at the district level"*
>
> *Multisectoral Provincial Workshop Participant, 2019-20*

To ensure that each Province has a functional Mental Health Directorate in place, the establishment of nine Mental Health Directorates, each comprised of a Director, 4 Deputy Directors, 1 Assistant Director, 1 Technical advisor (Advanced Psychiatric nurse), one Information Systems Officer, one Data Analyst, one Senior Administration Officer, and one Personal Assistant for the Director (Figure 12). This structure is in alignment with the recommendations of the Human Rights Commission Report [3]. The staff grades and the cost of employment of each Directorate member are outlined (Table 33). As outlined in Figure 12, each member has a unique role in supporting the mental health service landscape including oversight for compliance with the Mental Health Care Act (2002), support of speciality programmes, support and oversight to the provision of community-based mental health services, including coordination and oversight of the NGO service platform, and one Deputy Director for Substance-Abuse Programmes. Sufficient personnel for the consolidation of information systems, data analysis and overall system administration is also included. The Directorate is also allocated a technical advisor, typically an Advanced Psychiatric nurse, to provide essential input in service management and provision.

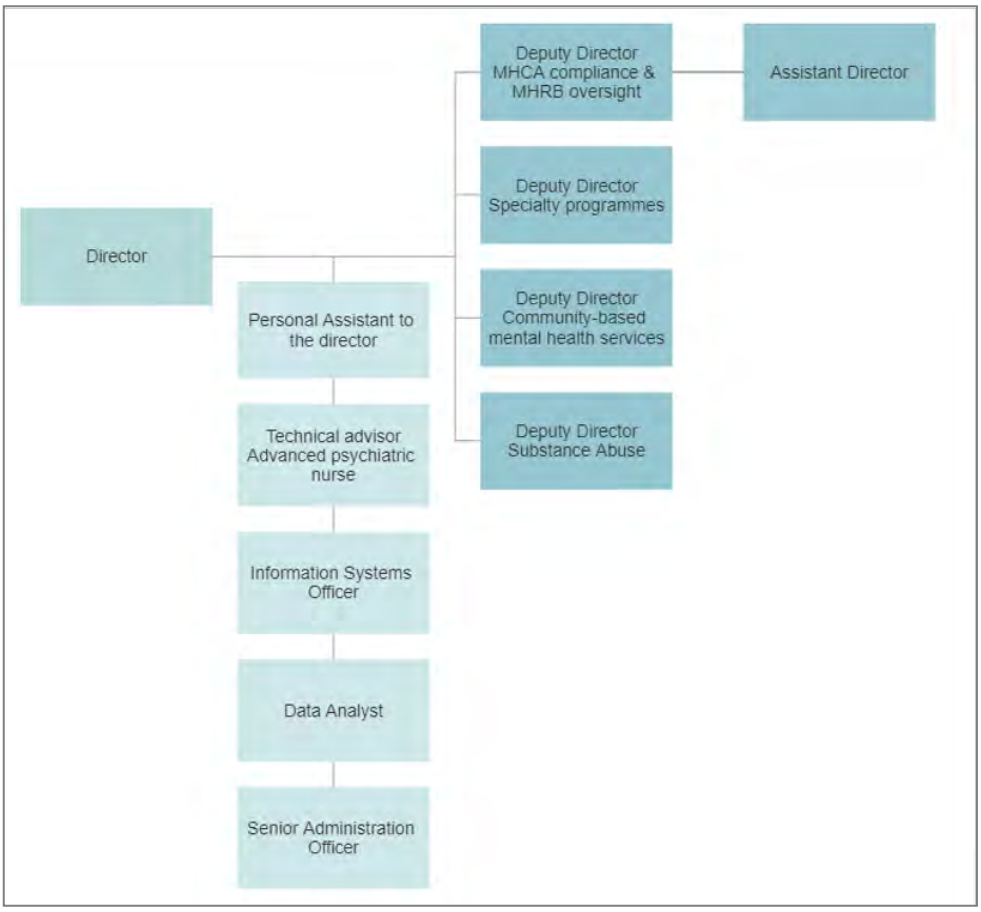


Figure 10 Staff and Structure of Provincial Mental Health Directorates

Whilst it is acknowledged that some provinces do have Directorates in place, none currently have the full staffing complement recommended. Considering financial and human resource constraints, these Directorates may need to be established gradually, and as such, full costs may not be assumed from the first year of scale-up (as estimated within this Report). The annual cost of each Directorate is estimated at ZAR 61.4 million.

Table 33 Unit Costs and Structure of Provincial Mental Health Directorates

Directorate Staffing Level	Cost of Employment (ZAR, NPV)
Director	1,139,058
Deputy Director x 4	863,748
Assistant Director x 1	729,455
Technical advisor (psych nurse): grade 2	660,081
Information systems officer (computer systems analyst)	318,492
Data analyst (data typist grade 2)	166,117
Senior administrative officer	217,688
Personal assistant (administrative officer assistant)	138,939
Total Cost per Directorate per year	61,423,399

Table 34 summarizes the Appropriation Estimates for Mental Health Governance per MTEF period over the 15-year scale-up period. No annual salary increases have been modelled; this is likely to change once salary increases are re-introduced in the public sector. The total cumulative costs for nine Provincial Mental Health Directorates are estimated to amount to ZAR 921.4 million over the 15-year scale-up period (ZAR 733.27 million, NPV).

Table 34 Appropriation Estimates for Mental Health Governance Structures per MTEF period over the 15-year scale-up period

Governance Structure(s)	Governance Structure Appropriation Estimates per MTEF period over 15-year scale-up ZAR, million, % of 15-year total					Cumulative 15-year Investment ZAR, million
	Year 1-3	Year 4-6	Year 7-9	Year 10-12	Year 12-15	
National Forensic Directorate	8.85	8.85	8.85	8.85	8.85	44.25
	20%	20%	20%	20%	20%	
9 Provincial Mental Health Directorates	184.27	184.27	184.27	184.27	184.27	921.35
	20%	20%	20%	20%	20%	

National Forensic Mental Health Directorate

To ensure that the country has a functional National Forensic Mental Health Directorate in place, we have costed the establishment of this Directorate, comprised of a Director, Deputy Director, Assistant Director, and an Administrative Assistant. Whilst this Directorate currently has a Director in place, there remains insufficient additional personnel to support this function; the total estimated needs for the Directorate are therefore estimated. The staff grades and the cost of employment of each member were drawn from the estimates included in Table 33, adjusted for the smaller composition of this Directorate. The total cumulative costs for the National Forensic Directorate amount to a cumulative investment of ZAR 44.25 million (ZAR 35.22 million, NPV) (Table 34). Whilst it has not been costed here, it is acknowledged that the National Mental Health Directorate may also need to be assessed to determine the full complement of staffing needs and related costs.

Mental Health Review Boards

Regarding the costs associated with establishing and maintaining Mental Health Review Boards, we have outlined a unit cost per Board in Table 35. We have not costed the establishment of these boards in each province over the scale-up period. In several Provinces, Mental Health Review Boards are already in place, however, there remains a lack of agreement regarding the Provincial needs in the future, both in terms of the number of Boards needed per Province, and in terms of clarity regarding their roles and resource needs to ensure they can function effectively.

Table 35 Unit Cost and Structure for Mental Health Review Boards

Unit Costs and Structure (ZAR, NPV)	
Chair	254,452
Legal Representative	190,795
Community Representative	190,795
Administrative Officer	166,117
Total Cost per Board	802,159

17.

Planned Patient Transport for Inter-facility Transfers

> *"I mean our service users are 900-kilometres from their home"*
>
> *Multisectoral Provincial Workshop Participant, 2019-20*

The analysis of costs associated with interfacility transport rendered through the Emergency Medical Services has been determined based on the Western Cape Government Health's (WCGH) Emergency Medical Services (EMS) model, with assumptions on utilization and cost drawn from their pre-Covid service delivery indicators. All transport for mental health care users is determined based on Advanced Life Support (ALS) needs, given the complexity in transferring this population and possible sedation during transfers. Adjustments were performed based on literature to adapt these data to capture the variability in urban and rural transport needs.

The estimation of costs per transfer was therefore determined as the sum of fixed costs and variable costs. Fixed costs associated with planned

patient transfers include the set vehicle tariff added to the cost of staff (based on costs of employment per annum, aggregated across all occupational service dispensation bands for each cadre, inclusive of 30% benefits) (Table 36)

Table 36 Calculation of Fixed Costs for Planned Patient Transport for Interfacility Transfers

Calculation of Fixed Costs	Per 24 hours ZAR	Per 1 hour ZAR	Per 15 minutes ZAR
Vehicle Tariff	600.3	25.0	6.0
Crew Cost for ALS ambulance	17,948	747.8	187.0
Where ALS Staff costs over 24 hours = 2 x Intensive Life Support crew members and 2 x: Advanced Life Support crew members per 24 hour period (with each ILS + ALS crew member dyad working one 12-hour shift each per 24 hour period) at a rate of ZAR 3,385 per shift (ILS) and ZAR 5,589 per shift (ALS).			

Variable costs associated with planned patient transfers include the sum of vehicle costs (expressed per km), Personal Protective Equipment (PPE) per trip and Medical Consumables per trip (Table 37)

Table 37 Calculation of Variable Costs for Planned Patient Transport for Interfacility Transfers

Calculation of Variable Costs	ZAR
Vehicle costs	4.62 per km
PPE costs per crew	
N95 respirator (x 2)	26.48 per trip
Aprons (x 2)	3.10 per trip
Face Shield (x 2)	90.00 per trip
Gloves (DBL) (x 2)	9.20 per trip
Medical Consumables per patient	
Nasal Cannula	9.5 per trip
Non-re-breather mask	11.72 per trip
Surgical mask	0.5 per trip
Oxygen Cost	31.74 per trip

We developed urban and rural cost models by determining the average difference in distance between health facilities in rural and urban provinces, with the Western Cape pre-covid data informing the urban model and serving as the basis for the development of the rural model. According to the Western Cape Government Health's (WCGH) Emergency Medical Service (EMS), the average transportation time for psychiatric interfacility transfers (one-way) is 31 minutes. Assuming an average speed of 100km/hour, and round trip duration of 62 minutes, each transfer is estimated at 103.2km (round-trip).

A paper published in 2018 [91] outlined the median driving distance to reach percutaneous coronary intervention facilities for each Province in South Africa. We used these estimates to calculate the average difference in the driving distance among rural and urban Provinces, determining that among rural Provinces, driving distances can be assumed to be 3.6 times

longer when compared to urban Provinces. By this rationale, we estimated that the average round-trip transfer for psychiatric interfacility transfers in rural settings is 3.6 times the round-trip estimate for the Western Cape, equal to 369.3km. Assuming an average speed of 100km/hour, the average transportation time (round trip) was therefore 222 minutes.

Based on the assumption that 34% of South Africa is rural, with 66% of the country classified as urban [92], as well as the fixed and variable cost calculations outlined above, the estimates outlined in Table 38 were used to calculate the total cost of Planned Patient Transport for Interfacility Transfers for mental health.

Table 38 Urban and Rural Costs for psychiatric interfacility transfers

Interfacility Transfer Cost Assumptions	Urban	Rural
Average distance per round-trip psychiatric transfer (km)	103.2	369.3
Average transportation time per round-trip psychiatric transfer (minutes)	62	222
Total Fixed and Variable Costs (ZAR)	1417.2	6477.4
Proportion of transfers (%)	66	34

The estimated number of persons requiring Planned Patient Transport for Interfacility Transfers required per year were estimated based on the number of persons transitioning from acute hospital inpatient care to long stays (for psychosis, bipolar disorder, and substance-use disorder) as well as the number of persons transitioning to residential community-based care (for psychosis, bipolar, dementia and intellectual disability). All forensic patients were assumed to require at least one transfer. During the 15-year scale-up period, (Table 39)

Table 39 Persons requiring Planned Patient Transport for Interfacility Transfers and Cumulative transfers over scale-up

Transfer Area	Annual Inter-facility Transfers Needed Medium Term Estimates			Inter-facility Transfers Needed per MTEF period over 15-year scale-up					Total Transfers Needed: 15-year scale-up
	Year 1	Year 2	Year 3	Year 1-3	Year 4-6	Year 7-9	Year 10-12	Year 12-15	
Rural	6,318	7,606	8,959	22,883	35,521	48,862	62,453	78,788	248,508
Urban	12,265	14,764	17,391	44,420	68,953	94,850	121,232	152,942	482,398
Total	18,583	22,370	26,350	67,304	104,475	143,713	183,685	231,730	730,907

A total investment of an estimated ZAR 2.29 billion (ZAR 1.73 billion, NPV) will be required to ensure appropriate planned patient transport for interfacility transfers over the scale-up period (Table 40) Although 66% of these transfers are projected to occur in urban areas, rural transfers account for 70% of the total cost, owing to the large distances between facilities. It bears mentioning that the South African Police Service (SAPS) have an obligation to protect, apprehend, and assist with transfer of

people with mental illness to and between health establishments. In the absence of estimates of need for these transfers, only inter-facility and post-discharge transfers to community-based residential and forensic services have been estimated.

Table 40 Inter-facility Transfers Appropriation Estimates per MTEF period over 15-year scale-up

Transfer Area	Inter-facility Transfers Appropriation Estimates per MTEF period over 15-year scale-up ZAR, million % of 15-year total					Cumulative 15-year Inter-facility Transfer Investment ZAR, million
	Year 1-3	Year 4-6	Year 7-9	Year 10-12	Year 12-15	
Rural	148.22	230.08	316.50	404.53	510.34	1,609.67
	9%	14%	20%	25%	32 %	
Urban	62.95	97.72	134.43	171.82	216.76	683.67
	9%	14%	20%	25%	32%	
Total	211.18	327.81	450.92	576.34	727.10	2,293.35
	9%	14%	20%	25%	32%	

"…Education are involved but unfortunately the youth services are not working optimally... we are expected…to provide services to this group of patients… because the majority of them are at school…. usually they don't …come in the morning otherwise they miss school…."

Multisectoral Provincial Workshop Participant, 2019-20

" …if we really want to tap into adolescence is creating avenues where we can inculcate positive psychology, capacitate them…then they can feel that 'I can take care of myself'…they feel secure"

Multisectoral Provincial Workshop Participant, 2019-20

18.
Social-Emotional Learning Programmes

School-based interventions to prevent depression and/or suicide typically involve a trained facilitator (e.g., a teacher, health professional or lay worker) delivering a series of intervention modules that teach young people psychotherapeutic strategies to improve their overall wellbeing and/or reduce their risk of poorer mental health outcomes. The design of the programme and efficacy estimates were based on a recent international systematic review of the literature that was conducted as part of the WHO/UNICEF Helping Adolescents Thrive (HAT) initiative [93]. The intervention effect size for suicide mortality was drawn from a trial conducted in Europe 'the Saving and Empowering Young Lives in Europe (SEYLE) study'[94]. The study found that the intervention led to a 54% reduction in the incidence of suicide attempts amongst adolescents receiving the intervention. Other reviews reported inconclusive evidence related to the impact of psychological on reducing the risk of suicidality among adolescents, however [95-97].

The components of the SEL programmes modelled are outlined in Table 41. The main outcomes of interest through the delivery of universal/indicated SEL programmes were reductions in the total number of incident depression/anxiety cases and suicide deaths. These were applied to depression incidence and suicide mortality, among adolescents who were both at-risk and were diagnosed with depression.

Table 41 Components of the Social Emotional Learning (SEL) psychosocial intervention

Domain	Component	Intervention details
Emotion	Emotion regulation	Techniques to improve one's ability to manage and respond to emotions effectively.
	Stress management	Techniques to control levels of stress – especially chronic stress that interferes with everyday functioning.
	Mindfulness	Activities to enhance the individual's ability to "pay attention in a particular way: on purpose, in the present moment, and nonjudgmentally")
Cognitive	Problem-solving	Techniques to identify and act on a solution to a challenge/difficult problem.
	Drug and alcohol knowledge	Education about the use of drugs/alcohol, or the effects of drugs/alcohol on development, lifestyle (including harm minimization approaches) and beliefs/ perceptions about drugs/alcohol.
Social	Interpersonal skills	Improving skills to develop or improve close, strong, positive relationships with other people
	Assertiveness	Improving skills to communicate one's viewpoint, needs or wishes clearly and respectfully.
Physical	Physical	Opportunities to engage in sports and/or physical activity, either individually or in teams

These intervention effect sizes were only applied for a single year following the intervention, with the assumption that the intervention effect size would completely diminish within 1-2 years. Intervention effects were only applied to learners between the ages of 12 to 17 years and provided they still fell into that range in the subsequent year they would receive the full intervention effect once again.

As outlined in the costing methodology, input assumptions related to the delivery of indicated and universal Social and emotional learning programmes in schools was undertaken by the WHO as part of a multi-country analysis of the delivery of these interventions. The teacher per student ratio assumed for the analysis has been adjusted according to data obtained from the Department of Basic Education in which a ratio of 31 learners per teacher is assumed. To obtain the number of teachers required for partial implementation by year 3 in which 50% of schools have been reached with the programme, and for our treatment coverage target of 91% of schools, the total number of learners expected to be reached (all school-going children between the ages of 12-17 in the case of universal programmes, and 5% of those learners in the case of the indicated programme), the expected number of learners, is divided by the number of students per class (31), multiplied by 11 hours of extra education required for the intervention per year, divided by the number of

hours worked per year for each teacher. For this analysis, taking into account school holidays and weekends, teachers are estimated to work for 1575 hours per year. This translates to an estimated 6.2 teacher FTEs per year per district of 0.5 million inhabitants for partial implementation of 50% of schools, and 11.3 teacher FTEs per year per district of 0.5 million inhabitants for 91% of schools, estimated for our target. As outlined earlier, the total number of learners between the ages of 12-17 is 6,279,185, which is translated into 55,044 learners per district.

The staff involved in the provision of the universal and indicated SEL services as modelled by the WHO and their assumed cost of employment are listed in Table 42. These costs will require validation with the Department of Basic Education and health, but in the interest of transparency for this analysis, they are included below. Annual human resource needs across all admin levels are summarized below according to the phases of roll-out anticipated.

Table 42 Staff Involved In the provision of Universal and Indicated SEL programmes in schools.

	Gross annual salary	Planning (Year 1)	Development (Year 2)	Partial implementation (Year 3-5)	Full implementation (Year 6-15)
Universal SEL programme staff assumptions					
Programme management (incl. M&E)					
Director	303,749.63	2	3	2	3
Manager	189,750.81	3	6	18	21
Administrative officer	147,146.07	7	13	36	42
Clerical officer	147,146.07	14	25	72	83
Secretary	87,974.65	12	22	12	22
Accountant	147,146.07	3	6	3	6
IT. computing manager	189,750.81	2	3	2	3
IT. computing officer	147,146.07	3	6	3	6
Cleaner	87,974.65	3	3	3	3
Promotion / media / advocacy					
Public health specialist	303,749.63	7	7	7	7
Public health officer	189,750.81	14	14	72	72
Health educator/trainer	189,750.81	2	14	14	14
Public Relations Manager	189,750.81	1	1	1	1
Public Relations Officer	147,146.07	1	1	1	1
Delivery of SELL / life-skills programme					
Health educator (teacher)	147,146.07	0	0	72	1308
Supervisor (certified trainer, psychologist)	147,146.07	0	0	4	65
Indicated SEL programme staff assumptions					
Programme management (incl. M&E)					
Director	303,749.63	2	3	2	3

	Gross annual salary	Planning (Year 1)	Development (Year 2)	Partial implementation (Year 3-5)	Full implementation (Year 6-15)
Manager	189,750.81	3	6	18	21
Administrative officer	147,146.07	7	13	36	42
Clerical officer	147,146.07	14	25	72	83
Secretary	87,974.65	12	22	12	22
Accountant	147,146.07	3	6	3	6
IT. computing manager	189,750.81	2	3	2	3
IT. computing officer	147,146.07	3	6	3	6
Cleaner	87,974.65	3	3	3	3
Promotion / media / advocacy					
Public health specialist	303,749.63	7	7	7	7
Public health officer	189,750.81	14	14	72	72
Health educator/trainer	189,750.81	2	14	14	14
Public Relations Manager	189,750.81	1	1	1	1
Public Relations Officer	147,146.07	1	1	1	1
Delivery of SEL / life-skills programme					
Screening for subthreshold depression (teacher)	147,146.07	0	0	39	706
Health educator (teacher)	147,146.07	0	0	5	92
Supervisor (certified trainer, psychologist)	147,146.07	0	0	0	5

The delivery of these interventions requires a range of different staff to undertake different functions including programme management required for oversight monitoring, reporting and monitoring of the interventions; public health staff involved in advocacy and dissemination of promotion and media content-including the costs of the mass media material (including television and radio time, posters and flyers); health educators involved in the delivery of the SEL/life skills programme and in the case of indicated interventions, screening for subthreshold anxiety and depression and certified-trained psychologists to oversee and supervise the health educators, as well as a range of national, provincial and district training workshops. Transport costs involved for the health educators who would be roving across the schools are also included.

Mass media costs included flyers and leaflets that provide information on adolescent mental and available services for which they can be referred and information about programming for providers. These flyer costs are only applied once programme implementation has reached full coverage of 91% of schools. The unit cost of these flyers, estimated at 1.26 rand per leaflet are applied to the full number of students, assuming each flyer can

last 2 years to derive the total cost of mass media for the programme. This is applied to both universal and indicated school-based interventions. For the indicated intervention, additional costs for the printing of screening tools and flyers are costed starting from year three in which partial implementation of schools are reached and assuming a 5% prevalence amongst learners with sub-threshold anxiety. The number of learners reached by each year of implementation has been outlined in the earlier section of the report related to the baseline and coverage rates outlined for each intervention. The unit cost of printing the screening tools per page was estimated at ZAR 0.14.

19. Radio-based Mental Health Promotion

It has been reported that ZAR 10,996,478 was spent on radio awareness campaigns for COVID-19 from the South African Broadcasting Corporation and 60 community radio stations [98]; translating to 65% of the total radio budget for COVID-19 awareness campaigns. Based on current expenditure on COVID-19 services in the country of ZAR 21 billion [99], this radio-based advocacy effort represented 0.051% of the overall COVID-19 service investments made by the Government. We, therefore, applied the same proportion to our estimated service costs (excluding expenditure on forensic mental health services, infrastructure, and other programmatic investments). For the 15-year scale-up period, radio-based mental health advocacy campaigns have been allocated approximately ZAR 105 million (Table 43).

Table 43 Total Allocated Budget for Radio-based Mental Health Promotion Campaigns per MTEF period over 15-year Scale-up, ZAR million

	Radio-based Mental Health Promotion Campaign Appropriation Estimates per MTEF period over 15-year scale-up ZAR, million % of 15-year total					Cumulative 15-year Investment ZAR, million
Campaign	Year 1-3	Year 4-6	Year 7-9	Year 10-12	Year 12-15	
Radio-based Mental Health Awareness through SABC & 60 community radio stations	11.08	16.23	21.15	25.52	30.96	104.95
	11%	15%	20%	24%	29%	

20.

Investing in a Comprehensive, Scaled-up Mental Health Response

Scaled-up implementation of evidence-based treatment and prevention will expectedly place new resource demands on South Africa's health and welfare systems owing to increased needs for administration and governance arrangements at all levels of the health system. This includes the provincial and district levels, additional human resource needs and training, upgraded infrastructure, increased access to medicines and improved information management and surveillance systems. Financing the budgetary implications of these demands is paramount to supporting South Africa's move towards universal health coverage and the inclusion of mental health and intellectual disability in the basket of services to be provided under the country's proposed NHI plans.

Table 44 summarizes the total package of services for MNS disorders estimated in our analysis according to each sector, accounting for both treatment and care-related costs, as well as all capital infrastructure, training and governance arrangements required.

Table 44 Medium Term Appropriation Estimates of the Total Investment for a Comprehensive Scaled-up Mental Health Response for South Africa over 15-year scale-up

	Medium Term Appropriation Estimates per MTEF period over 15-year scale-up ZAR, million % of 15-year total					Cumulative 15-year Investment ZAR, million	
Cost Component	**Year 1-3**	**Year 4-6**	**Year 7-9**	**Year 10-12**	**Year 12-15**		
Health							*NPV*
Facility based Health Services	24,681.94	41,600.16	58,565.93	74,988.58	93,968.50	293,805.10	*221,138*
Community-based services	153.39	647.82	1,437.99	2,523.67	4,024.35	8,787.22	*6,300*
Training	13.61	13.61	13.61	13.61	13.61	68.04	*54*
Planned Patient Transport for Inter-facility Transfers	164.93	270.1	376.61	480.15	601.54	1,893.33	*1,428*
Transfer to community residential homes	2.87	11.81	25.93	45.29	72.06	157.96	*113*
Hospital Capital Costs	7,864.19	4,616.11	2,930.44	4,191.20	688.8	20,290.74	*17,273*
Day-care Centres Capital Costs	74.78	163.39	230.62	332.56	430.07	1,231.43	*916*
Governance (Provincial Mental Health Directorates)	184.27	184.27	184.27	184.27	184.27	921.35	*733*
Radio-based Mental Health Promotion	11.08	16.23	21.15	25.52	30.96	104.95	*80*
Total	**33,151.06**	**47,523.50**	**63,786.55**	**82,784.85**	**100,014.16**	**327,260.12**	***248,036***
Forensic Services							
Forensic Assessments	1,019.34	1,054.23	1,086.62	1,117.95	1,148.47	5,426.61	*4,295*
Forensic Transport Services	43.44	46.00	48.53	51.10	53.72	242.79	*191*
Forensic Assessment Unit and State patient precincts	43,806.24	1,531.23	1,424.35	1,377.19	1,345.61	49,484.63	*45,515*
National Forensic Directorate	8.85	8.85	8.85	8.85	8.85	44.25	*35*
Total	**44,877.87**	**2,640.31**	**2,568.35**	**2,555.09**	**2,556.65**	**55,198.28**	***50,037***
Social Development							
Day Care Stipends for mild ID	6.59	31.64	75.62	139.29	223.17	476.32	*340*
Substance Abuse Treatment Centres Capital Costs				13.02	21.41	34.43	*23*
Substance Abuse Treatment Centre Inpatient Service	233.41	891.18	1,505.73	2,068.83	2,563.47	7,262.63	*5,513*
Total	**240.00**	**922.82**	**1,581.35**	**2,221.14**	**2,808.05**	**7,773.38**	***5,877***
Education							
Indicated SEL programme	203.02	594.41	801.24	809.09	811.64	3,219.40	*2,452*
Universal SEL programme	200.60	590.56	805.36	806.87	805.36	3,208.76	*2,444*
Human Settlements							
Community-based Residential Capital Infrastructure	237.23	989.84	2,192.83	3,852.02	6,154.25	**13,426.17**	***9,626***

It is important to mention that the infrastructure investments estimates are provided in real terms and not annualized over the lifespan of the capital investments, which are estimated to be 30 years. Furthermore, given that training requirements are modelled very conservatively to cover all PHC staff by the scale-up period, it is likely that training can be conducted over a shorter period, in which case, training costs would also be annualized; this could be undertaken over a 3-5 year period.

Furthermore, not all costs would be borne by the health department, and there exists a wide range of conditional grants outlined later in the report that may cover the training, transport, and infrastructure investments estimated in this analysis; therefore the potential of creating a mental health conditional grant would not need to include those investments.

- Department of Health

Whilst still within the health mandate, total costs related to the provision of forensic services including 30-day assessments, infrastructure requirements for forensic assessments and long-term state patient stays are summarized separately. The total investments required by the Department of Health amount to approximately ZAR 327.3 billion (ZAR 248 billion, NPV) over the scale-up period, while total costs over the scale-up period for the provision of forensic services amounts to ZAR 55.2 billion (50 billion net present value). These costs translate to an average annual expenditure of ZAR 21.8 and 3.7 billion, respectively. Together, these costs translate to 11% of the current health budget of ZAR 224.7 billion. The health budget was also conservatively projected for the scale-up period, assuming no growth for this MTEF period and a subsequent 2% growth thereafter only accounting for population growth. These total costs reflect 9% of the modelled budget in 2035, estimated at ZAR 285 billion. When looking at the net-present value of the total investment required, costs would amount to 9% and 7% of the current and projected health budget. It has been estimated that to match the most comprehensive mental health systems in the world, countries should expect to allocate up to 10% of the total health budget to mental health [100], and therefore our estimates fall within recommended norms. Furthermore, the analysis assumed that currently, no provincial mental health directorates or staffing at the national forensic directorate exist, which is not the case, although none of the provinces have the full staffing complement recommended in this analysis.

Assuming that other grants and health budget line items bear the cost for infrastructure investments as well as emergency transport services, and therefore only considering direct service provision, training, supervision, governance and behaviour change campaigns be considered within a mental health conditional grant, this amount would translate to a

requirement of ZAR 309 billion over the scale-up period or an annual allocation of approximately ZAR 21 billion. In the first MTEF period, these direct service delivery costs amount to an annual average investment of ZAR 6.7 billion; in comparison, currently estimated expenditure on mental health services based on the national costing exercise, after inflating to 2020 costs amount to ZAR 8.1 billion. Table 45 compares the investment case appropriation estimate for the above mentioned cost components (borne by the Department of Health) with the current estimated expenditure on mental health services in South Africa. Assuming a 2% annual increase for population growth for each MTEF period, the estimated deficit between the current resource envelope for mental health services and the projected resource envelope required for scale-up estimated within this analysis is outlined. As indicated, during the first

Table 45 Current vs. Projected Medium Term Appropriation Estimates for Department of Health over 15-year scale-up

	Medium Term Department of Health Appropriation Estimates per MTEF period over 15-year scale-up ZAR, million				
	Year 1-3	Year 4-6	Year 7-9	Year 10-12	Year 12-15
Projected Actual Appropriation Estimates per MTEF	24,850.44	26,371.49	27,985.64	29,698.58	31,516.38
Investment Case Appropriation Estimates per MTEF	26,072.48	43,525.17	61,318.42	78,862.45	99,379.01
Estimated Additional Appropriation Request	1,222.04	17,153.68	33,332.78	49,163.87	67,862.63

hypothetical MTEF period, the investment deficit is minimal (ZAR 1.2 billion). By the final MTEF period, as population coverage expands significantly, the deficit grows to ZAR 68 billion.

- Department of Social Development

Whilst the personnel providing rehabilitation support both within-day and residential centres are paid through the Department of Health, the Department of Social Development provides subsidies for individuals living with mild to moderate intellectual disability. The total value of the estimated subsidies over the scale-up period amount to approximately ZAR 476.32 million (340.15 net present value, or an average annual estimate of ZAR ZAR 31.75 million in real terms). Furthermore, the Department of Social Development has the mandate over the provision of substance-use rehabilitation centres which have been estimated to amount to ZAR 3.43 million in capital costs over the scale-up period or an average annual estimate of ZAR 2.30 million. All acute withdrawal services for both alcohol and substance-use disorders are assumed to be managed within hospital settings and fall under the responsibility of the Department of Health, in alignment to current treatment guidelines. The inpatient costs associated with managing long term stays at substance abuse treatment centers for opioid and non-opioid withdrawal are however assumed to be borne by the Department of Social Development; estimated to amount to ZAR 7.3 billion over the scale-up period or an

average annual estimate of ZAR 484 million. Long term stays have not been redirected away from the psychiatric hospital levels in recognition of the severe limitation of current infrastructure capacity and geographical distributions of rehabilitation centers remain limited. Furthermore, while exact estimates are not available, a large proportion of those diagnosed with substance-use disorders are assumed to have comorbid psychosis, and therefore would be provided for at the psychiatric hospital level.

Together, the appropriation estimates for mental health for the Department of Social Development amount to an average annual expenditure of ZAR 518 million, over the scale-up period; translating to 0.23% of the budget of ZAR 226.89 billion for the 2022/23 period. Social Development is also responsible for the provision of disability grants, although the aggregation at the national level does not allow for disaggregation on the diagnosis of individuals receiving grants for estimation of SASSA grants contributing towards individuals living with MNS disorders; as such, their expenditure on mental health is likely to be much larger, although people living with MNS disorders represent a vulnerable population that may not be able to readily access these grants.

- Department of Basic Education

The education department would be expected to fund the social and emotional learning programmes modelled in this analysis. On account of the fact that the majority of the programmatic investments for indicated and universal SEL programmes are similar, only one of the two interventions would be considered, as a result, these costs are kept separately. Cost for the delivery of indicated SEL interventions for children with sub-threshold depression or anxiety costs slightly more than the universal programme on account of the additional teacher time required to screen children and the associated training cots. The delivery of indicated or universal SEL programmes are estimated to amount to ZAR ZAR 3.22 and 3.20 billion respectively over the scale-up period (2.45 and 2.44 billion net present value). The average annual expenditure of ZAR 214 million translates to approximately 1% of its allocated budget of ZAR 28.59 5 billion in the 2022/23 period.

- Department of Human Settlements

In light of the mandate of human settlements to provide housing needs for vulnerable populations, the costs estimated for the establishment of residential units would be borne directly by this department. These costs amount to ZAR 13.42 billion over the scale-up period (9.63 billion net present value). The estimated average annual investment of 895 million translates to just under 3% of its allocated budget of ZAR 32.79 billion in the 2022/23 period.

21.

Consensus across Multidisciplinary Experts

Randomized controlled trials are globally recognized as the strongest form of evidence from which to base decision-making; whilst expert consensus has increasingly been placed lower in the hierarchy of relevance in the decision-making space. However, it has been argued that expert consensus should not be automatically considered as a less optimal approach to decision-making as the strength of evidence from which consensus is obtained is largely dependent on the evidence from which consensus is established. Such evidence may include systematic reviews, individual research endeavours, qualitative studies and personal experience; therefore expert consensus represents a fundamental underpinning of science. In ensuring that key stakeholders involved in Delphi studies form key constituents in service delivery, the likelihood of implementation is further strengthened. The Delphi method has been widely used in the area of mental health research and has been found to translate into important increases in the range of practices in the field[101].

It has been argued that there are key conditions that should be met to enable the successful consolidation of expert consensus. These include:

- *Diversity of expertise*. A heterogeneous crowd of experts will produce better quality decisions than a homogeneous one.

- *Independence*. The experts must be able to make their decisions independently so that they are not influenced by others.
- *Decentralization*. Expertise is held by autonomous individuals working in a decentralized way.
- *Aggregation*. There is a mechanism for coordinating and aggregating the crowd's expertise.

Whilst participants in our Delphi study identified challenges in being able to systematically appraise the wide range of interventions proposed, particularly in areas outside of their respective expertise, valuable insights and recommendations have been consolidated through this process. Furthermore, the findings of the Delphi study provide the opportunity to cross-validate interventions modelled in our analysis and identify additional areas for work and exploration in our setting for interventions that could not currently be modelled due to the absence of evidence. Table 46 outlines all interventions that, by consensus, represented a priority for scale-up amongst Delphi participants. Furthermore, a series of recommended indicators for inclusion in our information system are also summarized below. Furthermore, the table outlines the proportion of all initially proposed interventions that achieved the final consensus for inclusion.

Table 46 Priority Interventions by Consensus (Delphi study)

Priority Intervention Area	Intervention Details
Substance-use treatment (67%)	• Brief interventions and follow-up for alcohol use/dependence • Brief interventions and follow-up for drug use/dependence • Identification (using ASSIST) and assessment of new cases of alcohol use/dependence • Identification and assessment of new cases of drug use/dependence • Management of severe alcohol withdrawal • Relapse prevention medication for alcohol use/dependence • Screening using SBIRT and brief interventions for risky substance use • The Matrix Model: 16-week program consists of 8 sessions of early recovery (with two early recovery groups per week for the first four weeks), 32 sessions of relapse prevention (two relapse prevention groups per week for sixteen weeks), and other optional weekly individual or conjoint sessions. Clients typically attend two to four sessions per week. At least one mandatory random urine drug panel test screen is required on a weekly basis from all clients; for clients who are primary alcohol users, an alcohol breathalysers test is required. Delivered by a BPsych counsellor.
Child and Adolescent Mental Health treatment (38%)	• Diagnosis and management of childhood mental disorders such as autism and ADHD • Identification of children with Intellectual and MNS disorders in schools: including the provision of counsellors for assessments • Parent skills training for developmental disorders • Psycho social treatment/intervention and follow up behavioural disorders: Basic and Intensive • Psycho social treatment/intervention and follow up for developmental disorders: Basic and Intensive • Screening for developmental disorders in children • Sensory-Based Approaches such as sensory modulation-related interventions for those with disorders of trauma and attachment (DTAs)) • Web- and smartphone-based psychological therapy for depression and

Priority Intervention Area	Intervention Details
	anxiety disorders in adolescents: smartphone-based behavioural activation therapy (STARS) intervention
Integrated Primary Health Care for Depression/Anxiety with other Chronic Conditions (54%)	• A community health worker (CHW) assist the service user to access local community resources (day-care, residential care, support groups, psychosocial rehabilitation) post-discharge • Basic psychosocial treatment for mild depression • Diagnosis and management of severe depression • Psychosocial treatment and anti-depressant medication for anxiety disorders (moderate-severe cases): Basic and intensive • Psychosocial treatment and anti-depressant medication of first episode and recurrent (moderate-severe cases): Basic and Intensive • Screening and management of depression (including maternal) and anxiety disorders in people with HIV, with other NCDs* (using PACK or PC101) • Screening for depression and anxiety
Treatment for severe mental illness including measures to improve adherence, retention in care and prevention of relapse (37.5%)	• Dedicated Assertive interventions to actively follow-up on defaulters • Diagnosis and management of acute psychoses • Medication delivery to clients and their families • Psycho social support and anti-psychotic medication: Basic and Intensive • Psycho social treatment, advice, and follow-up for bipolar disorder, plus mood-stabilizing medication: Basic and Intensive • Respite care for caregivers of persons with severe MNS disorder
Mental Health Prevention and Promotion (60%)	• Advocacy programmes for mental health care users • Awareness campaigns to increase mental health literacy and address stigma and discrimination • HASHTAG: Health Action in ScHools for a Thriving Adolescent Generation: a school-based health improvement intervention for young at-risk adolescents (11-12 years). Developing and adapting multilevel, multicomponent gender-sensitive interventions targeting a range of negative mental and physical health outcomes by (i) promoting positive mental health, (ii) preventing mental disorders (specifically, depression and anxiety) and (iii) preventing a range of risk behaviours (substance use, violence, problem sexual behaviours). • Life skills training in schools to build social and emotional competencies • Parenting programs in infancy to promote early child development: stimulation of early literacy • Providing contact-based education programmes to communities and youth in schools
Integration of Mental Health into Maternal, Child and Infant Health program (83%)	• Management of severe maternal depression • Newborn screening for modifiable risk factors for intellectual disability • Psychoeducation for mothers • Psychosocial care for peri-natal depression • Screening for Maternal Depression
Community-based Residential and Outpatient options for Severe Mental Disorder(s) and Intellectual Disabilities including	• Post-discharge PSR (psychosocial rehabilitation) programs that are community-based and accessible to outpatients with the use of OTs • Self-help and support groups (for example, for alcohol use disorders, epilepsy, parents of children with developmental disorders, and survivors of suicide) • Ward-based primary healthcare outreach teams (WBOTs) are deployed from PHC clinics to households, where they can conduct mental health education and identification to improve mental health literacy in households, identify possible cases of mental unwellness and refer potential cases to PHC clinics where further management takes place

Priority Intervention Area	Intervention Details
Rehabilitation and Occupational Therapy (57%)	• Work readiness and supported work and reasonable accommodation in the workplace (e.g. formal/informal employment, disability grant assessments, workmen's compensation assessments, road accident fund assessments, medical-legal disability assessments; vocational opportunities)
Workplace Mental Health (67%)	• Detection and referral for mental health conditions in the workplace • Workplace stress reduction programs and awareness of alcohol and drug abuse
Forensic Mental Health (12.5%)	• Discharges to be linked to community-based care and support
Old-age mental health (20%)	• Interventions to support caregivers of patients with dementia
Data collection and indicators	
• **National survey to determine % rate of mental health care users who will come into contact with the Law and become State patients** • **Population surveys to be conducted to assess micro-level care outcomes-Brief QOL questionnaires** • **Availability of treatment interventions (psychotherapies and medicines) at each service level** • **Case detection rate (%) (< 18 years/>18 years)** • **Mental health care user readmission rate (%): 3/6 months** • **Mental health clients in casualty for 24 hours or longer** • **Mental health positivity rate (assessed positive)** • **Mental health screening uptake** • **Mental health total remaining on treatment** • **Number of discharges for State patients** • **Number of new admissions for State patients** • **Number of new referrals for State patients** • **Numbers of multidisciplinary staff members at each service level within each district and proportions of personnel vs case-load** • **Numbers, types, and distribution of community-based residential and day-care facilities** • **Numbers, types, and distribution of correctional service facilities** • **Numbers, types, and distribution of educational facilities for special needs children and adolescents (provided by Dept of Education)** • **Numbers, types, and distribution of substance use rehabilitation services, including those provided by health, social development, and NGOs** • **Treatment uptake**	

PART E

DISCUSSION & RECOMMENDATIONS

22.
General Considerations

The Urgent Need for Action

The outcomes of the national costing study that has formed the foundation for this Investment Case highlighted a significant treatment gap of over 90%, despite approximately ZAR 8.0 billion, or 5% of the 2016/17 health budget being expended on mental health services. This situation is likely to have substantially worsened during the COVID-19 pandemic. Whilst nationally representative statistics from South Africa are yet to be released, a recent study from India has revealed a 20% increase in mental illnesses since the coronavirus outbreak, whilst a meta-analysis on mental health and COVID-19 in China estimates the prevalence of anxiety and depression to be 31.9% and 33.7%, respectively [102].

Recently published evidence from South Africa [103, 104] exploring the mental health impact of COVID-19 found that adults who experienced childhood trauma were at a higher risk of having developed depressive symptoms owing to their perceived risk of contracting COVID in addition to predictions that the impact of COVID-19 is likely to present as post-traumatic stress, anxiety and mood disorders. A survey conducted by the Human Sciences Research Council in 2020 [105] reported that 33% of South Africans were depressed, 45% fearful and 29% experiencing loneliness during the country's first lockdown. Furthermore, the lockdown

period, despite its allowance for access to essential health services, has resulted in a decrease in overall facility attendance, including declines in mental health visits and reported increases in patients defaulting on their treatment appointments [106].

It has been argued that during times of global infectious pandemics, mental health is ignored, yet the mental health and socioeconomic ramifications are likely to be longer-lasting than the overall physiological impact of such experiences [107]. The strained fiscal climate in South Africa, with an 8.2% decline in GDP in 2020 and very limited recovery for 2021 (0.6%), coupled with estimates of unemployment close to 36% for the COVID-19 period [108], will only continue to exacerbate economic vulnerability amongst the population and likely result in continued increases in rates of depression, anxiety, post-traumatic disorder as well as substance abuse and violence.

A New Age of Awareness and Historic Opportunity for Global Stewardship and Economic Recovery

The 2018 Lancet Commission on Global Mental Health and Sustainable Development emphasised the need for a global mental health response that ensures the inclusion of mental health in the universal health coverage agenda, both as a humanitarian and development priority, with the sustainable development framework reframing mental health as key to broader global development [109]. The inclusion of mental health in the Sustainable Development Goals (SDG) agenda represents global commitments to consider mental health within investment priorities and places mental health on parity with general heath service development [110]. Thornicroft et al. [111] reflect on the mounting evidence for action, demonstrating that improved global mental health is a prerequisite for human and societal development. The authors note, 'it is also a barrier to achieving the suggested goal of promoting peaceful and inclusive societies for sustainable development, providing access to justice for all, and building effective, accountable, and inclusive institutions at all levels' ([111] p1). The goals of the SDGs make explicit recognition for the need for collaboration across sectors and disciplines; such partnerships must include civil society, private sector, governments and nongovernmental organizations. Lessons from these partnerships may be applied for the overall SDG agenda.

South Africa is a signatory of the United Nations Convention on the Rights of Persons with Disabilities [112], which has committed to providing fundamental freedoms to those living with disabilities. Limitations on accessing health, educational and employment opportunities further perpetuate poverty and poor health. Globally, governments have been galvanized to prioritize mental health as an integral part of their COVID-

19 response plan. Chile, previously reporting the lowest share of mental health spending amongst OECD countries (2.1%), has recently released their new budget plans committing to a 310% increase in spending, while Australia has doubled citizen entitlements for psychological therapy [113]. In 2019, New Zealand announced a 'well-being budget' founded on the premise that financial prosperity alone is an insufficient metric of the quality of a nation's life [114].

South Africa has also committed to universal health coverage (UHC) and is currently exploring the mechanisms by which a National Health Insurance mechanism can be funded and delivered; the inclusion of mental health within the benefits package will be key. South Africa's commitment to equitable health access requires that sufficient support is provided by the heath system and the other sectors which guarantee the right to health, inclusive of mental health. Rising to the challenge today can create a system that sustains our resources and generates significantly greater benefits for our nation. A historic opportunity is at hand to make positive and lasting changes. While devastating, the COVID-10 pandemic in South Africa has ignited a long-awaited impetus for collaboration, with successful public-private partnerships providing a model for successful NHI in the years to come.

Addressing Underlying Inefficiencies

Priority setting for Universal Health Coverage (UHC) is challenged by the complexity of mental health service delivery and the ethical and pragmatic dilemma of whether funding should be allocated to common mental illness such as depression and anxiety, which affects a larger proportion of the population, or less prevalent but more disabling conditions such as schizophrenia and bipolar disorder. The significant functional impairment and behavioural consequences of severe conditions may result in the neglect and potential discrimination of this vulnerable population within the health system and community [115]. Ideally, the mental health system should be able to address all needs in the population, but as a consequence of fiscal constraint, trade-offs are often required.

There is a growing body of evidence for cost-effective approaches for addressing the burden of mental health disorders in LMICs which include reducing inefficiencies in resource use by redistributing budgets from hospi-centric care to the community, task-shifting mental healthcare to non-specialist providers and the integration of mental health services in broader primary health care services[116].

The WHO has been strongly advocating for the decentralisation of mental health services over the last decade as an approach to improving access to treatment and care and ensuring the human rights of service users are upheld. This process was motivated by a number of factors including growing public awareness around the poor conditions and human rights

violations of mental health users living in institutionalized settings, the rising cost of inpatient care and the development of new and effective psychotropic medications [117, 118]. Research evaluating services have found clinical and non-clinical improvements amongst users of community-based services regardless of symptom severity [119, 120].

Despite considerable investments in research providing a sound evidence base for the effectiveness of interventions, such advances in the development of interventions have not translated into their scale-up in real-world, community settings. The Institute of Medicine estimates that it takes approximately 17 years to incorporate clinical research advances into everyday practice[121]. Economic evaluations can provide a critical role in the promotion of best-practice and the adoption of the most cost-effective interventions for scale-up. However, narrowly adopted perspectives of economic evaluations can limit the potential for implementation success, should key health system inputs, including managerial and clinical time for planning and training, infrastructure and ongoing costs for monitoring care quality and supervision not be considered and costed in tandem.

The ROI for South Africa

The analyses presented herein have outlined the South African Investment Case for a concerted and scaled-up response to the significant public health and economic burden of MNS disorders, including early intervention for our large populations exhibiting risky alcohol and substance-use and school-based interventions for learners, to promote their social and emotional well-being, before diagnosable mental health conditions take hold. The analysis suggests that the investment needed by the health Department to significantly scale up effective treatment coverage is substantial; the net present value across the 15 years of scale-up translates to ZAR 389.7 billion (303.5 Net present value), equivalent to an average of ZAR 26 billion per year, although many costs will be capital, upfront investments related to infrastructure development, thereby representing a longterm investment and not contributing to recurrent costs.

Together, these costs translate to 11.6% of the current health budget of ZAR 224.7 billion, whilst representing 9% of the projected budget expected by 2035, assuming a conservative 2% growth following this MTEF period. It has been estimated that to match the most comprehensive mental health systems in the world, countries should expect to allocate up to 10% of the total health budget to mental health [100], and therefore our estimates fall within recommended norms. The analysis reflects a 4.4-fold increase in coverage across MNS disorders, whilst requiring a doubling in the currently estimated expenditure on mental health by the end of the 15-year scale-up period. The increased budgetary need over time, relative to the substantial increase in coverage,

can be achieved through improved efficiency in service delivery and current expenditure – which presently results in a significant treatment gap on account of heavily hospi-centric services and insufficient investments in the district, primary and community health care levels.

This Investment Case also calls for contributions by other departments, namely the Department of Basic Education, Social Development, and Human Settlements in alignment with their mandates. In line with global initiatives, responding to mental health requires a whole of government approach. This includes an estimated contribution of ZAR 34 million annually by the Department of Social Development, ZAR 214 million through Basic Education, and ZAR 895 million by Human Settlements; all of which reflect less than 3% of their respective budgets.

These investments must be considered in light of the estimated losses to the economy should MNS disorders remain unaddressed. In 2021, economic losses are estimated at ZAR 151 billion and will amount to ZAR 2.4 trillion (1.9 trillion NPV) over the scale-up period, representing an annual loss of 4% of the country's GDP. The combined economic value of this lost productivity greatly exceeds the estimated cost of current mental health expenditure and the projected service scale-up. This is in alignment with estimates across OECD countries estimating economic losses of more than 4% of GDP due to unmanaged MNS disorders [113]. This does not account for the large informally employed workforce that currently exists in the country, thus presents a conservative estimate as to the magnitude of economic losses.

Furthermore, these investments should be reflected in conjunction with the significant returns-on-investment estimated for several of the conditions modelled, namely those addressing common mental disorders (depression and anxiety disorders), including those for perinatal and adolescent populations, epilepsy, as well as early interventions for risky alcohol and substance consumption. Whilst the cumulative costs reported above include service provision along with the programmatic investments required to enable their effective delivery, infrastructure and training requirements are not incorporated in the analysis. Their benefits will translate into broader health system improvements through widespread training of all primary health care providers as well as the long term benefits of infrastructure improvements.

These positive benefit to cost ratios, having included the social value of restored health and well-being, range between 1.2 and 4.7. Any benefit to cost ratio exceeding 1 is indicative of a valuable investment. Our analysis has found benefit-to-cost ratios of 4.0 and 3.6 for adult and childhood depression, 4.7 for perinatal depression and 1.5 and 0.6 for adult and childhood anxiety, respectively. Notably, after accounting for a modest annual increase in our GDP of 1.6% over the next 15-years, and including the health care savings the health sector will accrue through avoided

treatment costs, our returns increase to 4.4 and 4.3 for adult and childhood depression; 5.1 for perinatal depression and 1.6 and 0.7 for adult and childhood anxiety, respectively.

In comparison, global return-on-investment analyses report returns of 5.5 and 3.9 for depression and anxiety, respectively. The differences in our local estimates can be attributed to several factors. Firstly, this Mental Health Investment Case has taken into account our baseline service delivery environment, with 86% of spending occurring on inpatient care, thereby requiring a gradual shift toward more efficient primary and community-based service models over time, in tandem with programmatic and capital infrastructure investments needed to support such a service transition. Paramount to this redistribution of services is the provision of sufficient supervision to support generalist health workers; as a result, the cost of treatment at the primary care level has included supervision time provided by District Mental Health Teams, particularly for the management of complex cases. At 12% of GDP, and accounting for close to 65% of health expenditure, the government wage bill is considerable; when compared to OECD countries and other emerging economies, the remuneration of civil servants in South Africa is comparatively high [108] and drives the cost of service provision. Secondly, the global investment case has not yet modelled returns for children and adolescents, nor have specific interventions for perinatal service provision for depression been costed, as presented herein.

> ***"That's the reality, we have to decentralise the service, get it down to primary health care level and we need that money to reach primary health care"***
>
> *Multisectoral Provincial Workshop Participant, 2019-20*

Thirdly, local research and implementation experience has enabled the team to change key inputs modelled in the international ROI analysis. For example, whilst international intervention inputs recommend the provision of group and individual psychotherapy sessions on an equal basis, local service delivery has shown that the majority of users will not attend group counselling sessions, and as such, only 10% of those in need are modelled to receive group counselling in our analysis. Fourthly, the analysis has been undertaken during a considerable health and financial crisis in the country, illustrated by unemployment rates in the realm of 30%, a shrinking GDP and a labour force participation rate of just over 50%; all of which contribute to diminished estimates of economic returns. Whilst the economic outlook is not expected to improve in the short term in the country, it is hoped that in the medium-to-long term, economic improvements will translate into increased economic returns.

Promotion and Prevention

> ***"As soon as school is out, to get to the adolescents and teenagers, it is very difficult…youth services are not working optimally…because the majority of them are at school….so usually they don't …come in… otherwise they miss school"***
>
> *Multisectoral Provincial Workshop Participant, 2019-20*

Due to the paucity of evidence related to the impact of promotion and prevention interventions for mental health, thereby limiting the possibility of their inclusion in this analysis, there is worldwide recognition that childhood and adolescence represent a key window of opportunity to promote positive mental health, with demonstrated benefits across the life course. The analysis, therefore, includes the provision of early interventions for children and adolescents in schools through social and emotional learning programmes that have demonstrated long-term benefits, including improved emotional and social functioning, positive health behaviours, and improved academic performance[122]. This report includes the analysis undertaken by the WHO for a range of countries, including South Africa, with estimated returns-on-investment for the universal social and emotional learning programme, providing services for all school-going children aged 12-17 years, resulting in a 1.9 to 1 return-on-investment by the scale-up period; with the consideration of savings and a modelled increase in the GDP of the country over time, the return-on-investment for universal social and emotional learning programmes increase to 2.3. These positive returns result from the significant number of cases of depression and anxiety averted through universally delivered social and emotional learning programmes in schools, although such interventions only targeting learners identified to have sub-threshold depression and anxiety do not demonstrate similar returns.

The analysis suggests that targeting children before the development of symptoms in schools is a key preventive strategy for common mental disorders. Provision of intensive psychosocial interventions and medication within the health care context for children with moderate-severe depression does however yield significant returns-on-investment, particularly through significant improvements in remission and therefore reductions in the prevalence of these disorders amongst this population.

The return-on-investment for intensive interventions for adolescents with moderate-severe anxiety, by comparison, were not found to be as high. Approximately 30%–50% of youth receiving 12 weeks of combination treatment will continue to experience some residual symptoms [123]. The complexity of childhood anxiety and its interaction with a range of other comorbidities may be part of the reason for the limited returns-on-investment modelled in our analysis. As a result, treatment will need to be augmented or prolonged to strengthen outcomes by targeting residual

symptoms and the specific predictors of poor remission amongst children and adolescents with anxiety.

As mentioned in the methodology, estimated economic returns through the provision of interventions to children and adolescents are likely an underestimate, as immediate productivity gains due to reduced absenteeism and presenteeism were not included for children and adolescents, both for the facility-based and school-based interventions as they do not form part of the current workforce. In addition, there is currently no established methodology for translating how impacts on educational attainment during adolescence (which can be improved by mental health prevention interventions) translates into an improved job earning potential later in life. Furthermore, anxiety does not impose a mortality burden in comparison to depression, which further impacts the return-on-investment analysis.

It is well known, and reiterated through provincial engagement, that the lack of child- and adolescent-friendly services within the health care setting represents a significant impediment to accessing this population; this will need to be urgently addressed to make strides in improving the health and well-being of children and adolescents. Whilst this Investment Case has demonstrated that the provision of universal social and emotional programmes to all learners represents a promising, and high-yield, an opportunity for targeting this population; treatment for children and adolescents will need to be supplemented by parental involvement. Whilst our analysis models the provision of family psychoeducation and parental skill training for conduct and attention disorders, this should be expanded for children with co-morbid depression and anxiety to yield positive results. The lack of positive returns on investments for these interventions only specifically targeting conduct disorder and ADHD again is also affected by the lack of immediate productivity contributions by children.

A review of the impact of paediatric occupational therapy practice [124] has found that activity-based interventions have translated into improvements in children's social interaction, self-esteem and reductions in behavioural problems. Furthermore, in school settings, the provision of occupational therapy within integrated service delivery to students with disabilities and mental illness have also been demonstrated to be cost-effective amongst both students at risk and those without risks[125]. Their use in the provision of SEL interventions within schools has not been explored however within this analysis. Additional services that should be explored also include the provision of peer and family support groups; protective workshops; mental health literacy and self-care, although this has not been modelled yet within this analysis. Evidence from other setting have yielded very positive results from peer support programmes, both for children and adults.

Compared to standard community care for psychosis, which has been modelled for our context, early interventions for psychosis services for people with first-episode psychosis has been found to yield significant reductions in psychotic symptoms, reductions in suicide, hospitalisation, need for antipsychotic medication and care-giver burden, in addition to improvements in functioning, quality of life, and increased involvement in school and work. These interventions have only been delivered in high-income countries, and as such, the intervention inputs and feasibility of implementation need to be further explored in our setting. This intervention is however worth exploring as economic modelling undertaken in the United Kingdom has estimated a saving of £131 million (2.6 billion) over 10 years [126].

> ***"You know, currently our IEC [Information Education and Communication] material is only in English and Afrikaans so we don't have enough for Sesotho, Tswana so I think that is where we are lacking – translation of our IEC materials to cover others"***
>
> *Multisectoral Provincial Workshop Participant, 2019-20*

The analysis also includes the costs associated with the delivery of a mass radio campaign, with global evidence demonstrating reductions in poor health behaviour [127]. Whilst we have not modelled any impact associated with such a campaign, due to the lack of publicly available evaluations of Department of Health media campaigns, other examples have anecdotally demonstrated this mechanism as an effective mechanism to improve health literacy and reduce stigma. A study, undertaken in South Africa amongst health workers and service users [128] found that mental health stigma is perpetuated across family and friends, the broader community, employers and amongst health care providers; the causes of stigma often being misconceptions about mental illness. These findings were supported by our provincial workshop participants. The experience of stigma delays help-seeking and the mistreatment of MNS users. International research has demonstrated that communication should be recognized not only as a tool but as a framework from which identities are formed, with studies exploring the link between mass media and stigma for individuals living with MNS disorders demonstrating that such strategies can play a role in societal perceptions of mental illness [129]. Whilst radio is a key platform with which to reach all population segments in South Africa, the opportunities provided by social media platforms, particularly for adolescent populations, should be explored as an alternative or complementary strategy.

The development of mass communication and education material, in addition to service provision, should be provided in a language understood by patients, in alignment with the Patient's Rights Charter. It has been highlighted that for South Africa to meet its obligations towards the rights of access to non-discriminatory health care, then provision

should be made for translation services within health service provision. Language barriers remain an important contributing factor to adverse health outcomes. With respect to mental health, ensuring culturally appropriate communication is paramount [130]. A novel initiative developed in Argentina [131] and later rolled out in France uses media communication as an opportunity for people living with MNS disorders to play an active role in perception change by hosting these radio shows themselves. In light of the approach towards the decentralisation of mental health services and the increased delivery of care by generalist health workers, including community health workers, addressing mental health-related stigma will be integral.

Early Interventions for Risky Alcohol and Substance-use

South Africa reports the fifth-highest alcohol consumption rate in the world [132]; the resultant effects on trauma admissions, gender-based violence and risk-taking behaviour are considerable. According to a report published in 2020, just over the period between the 26th of March and the 3rd of April, 8700 cases of GBV were registered [133]. The Alcohol Advisory for the National Coronavirus Command Council, in their report to the Ministerial Advisory Committee, estimated that during the first lockdown period which included a ban on the sales of liquor, spanning approximately 4 months, a 60% to 70% reduction in trauma admissions were seen, saving the health department approximately 1.3 billion [134]. Whilst it is of course acknowledged that the alcohol ban does not represent a long term solution, the identification and provision of brief interventions for identified cases of risky alcohol and substance consumption (SBIRT) at the primary health care level and acute trauma wards represent a low-cost, early intervention, with local implementation demonstrating a high rate of feasibility and acceptance by stakeholders[135]; the potential long term impacts on reducing trauma admissions have not been modelled, however. A series of broader population and individual-level interventions have been recommended to address the country's substance abuse crisis [132, 136].

The provision of screening and brief counselling interventions for those identified as risky alcohol users yields a positive return-on-investment in our analysis, estimated to be 1.2 at the end of the scale-up period, and 1.3 after accounting for health care savings on account of reduced cases requiring intervention and modest GDP growth. Positive returns are not achieved for the provision of this intervention to those identified to be risky substance users, however. As previously mentioned, the impact of this intervention is relatively modest, with a 7.5% remission rate modelled for those identified to be risky alcohol users and 6.0% for risky substance users, pointing to the likely need for a more intensive intervention, particularly for risky substance-users. Further, these impact estimates are drawn from the global literature and require additional validation for our

context. Limited improvements in remission are explained by the low adherence rates assumed in this analysis, estimated at 50%. It is possible that as South Africa rolls out Screening, Brief Intervention and Referral to Treatment (SBIRT) programmes in the country, estimated counselling sessions may be adapted to optimise impact. Furthermore, these savings do not account for all other potential savings for example those associated with improvements in adherence to treatment for other chronic conditions, reductions in risky behaviours, trauma admissions and gender-based violence. It is also worth highlighting that these cost savings are conservatively measured against the cost of delivering SBIRT services; there is a strong likelihood that if these populations do not receive the necessary early interventions, risky alcohol and substance users are likely to become dependent, for which services are far more expensive. The average cost of the alcohol withdrawal and relapse prevention service amounts to ZAR 3,689, whilst for drug withdrawal, these costs rise to ZAR 58,030, per case. Therefore, the long-term savings through this preventative approach is likely to far exceed those that have been estimated within this Investment Case.

An evaluation of the provision of SBIRT in emergency settings in South Africa found that 37% of patients met the criteria for risky substance use, for which 83% received the intervention [135]. This therefore may demonstrate increased feasibility and adherence in our context relative to the global evidence base. The programme was adopted into routine services and found to be acceptable and appropriate by stakeholders owing to the recognized burden of substance-related harm in emergency centres and favourable patient responses. There were some concerns however amongst some stakeholders that the provision of this intervention may be incompatible with emergency centre operations and its rapid implementation limited effective engagement with a diverse stakeholder group. For our analysis, we modelled the provision of this intervention also in primary health care centres in which there may be less pressure to provide the service amidst the urgency to address the physical needs of people attending emergency centres. Assessments are also already underway to evaluate the outcomes of a national rollout of a cascade train-the-trainer model of task-sharing to build the capacity of the HIV workforce to deliver Screening, Brief Intervention, and Referral to Treatment (SBIRT) to address risky alcohol use [137]; with funding support for training provided for by PEPFAR.

Workplace Mental Health

Given the significant economic costs of inaction estimated through this analysis, compounded by the unique trauma experienced among South Africa's health workforce due to COVID-19, there is an urgent need to prioritize employee wellness programmes. Workplace mental health needs emerged as a very strong recommendation from the provincial workshops. Notably, workplace mental health concerns were raised by all

> ***"And you'll be surprised what comes out from the nurses. Some don't realise they are having a problem, they are just going on. And when you start training them, in-servicing them about stress and depression, you find some you need to refer"***
>
> *Multisectoral Provincial Workshop Participant, 2019-20*

Government sector participants attending the provincial workshops, and not limited to the health sector. In particular, participants noted significant increases in depression, anxiety, alcohol-use and substance-use disorders manifesting in their workforce.

According to global evidence, the essential components for workplace mental health programmes include [138]:

- Building resilience, through the supportive environments that allow for career growth and innovation, improved recognition of employees and their involvement in decision-making.
- Mainstreaming mental health, through increased awareness building.
- Reducing stigma and related discrimination against mental illness by increasing education and mental health literacy among employees and their supervisors.
- Focusing on interpersonal relations through conflict management, communication, particularly during organizational changes, relaxation training, and group-based stress education amongst emergency workers.
- Strengthening systems to appropriately providing screening, detection and care pathways for employees.
- Effective delivery of employee and family assistance programmes (EFAP) through the provision of peer counselling including those provided within digital platforms, and assessing the potential of reducing co-payments from medical insurance claims. For example, the *Vula* app, available in the country, could serve as an ideal platform for online support.
- Mental health scorecard to collect accurate indicators of the costs, process and outcomes of implementing these programmes, to be able to effectively measure the returns-on-investment over time. in order to measure the ROI over time.

An ROI analysis conducted in Canada [139] indicated a possible 2.2 return-on-investment amongst workplace programmes running for at least three years. Another analysis conducted by Deloitte [140] found the estimated cost of poor mental health in the workplace in the United Kingdom amounted to approximately £33.0 billion to £42.0 billion; the mid-point of which is equivalent to almost 2% of the United Kingdoms' GDP (2016). These costs are borne by a range of businesses, translating to approximately £497-£2,564 per employee, depending on the industry; although, the findings demonstrate that the majority of these costs are disproportionately born by the public sector, particularly in the health sector. The overwhelmingly positive return-on-investment of workplace mental health interventions, resulted in an estimated ROI of 4:1.

It is recognized that South Africa also holds a large informally employed workforce, estimated at 30% in 2019, with increases in the informal labour force being reported since 2013. The latest statistics published by STATS SA show that by the 4th quarter of 2020, informal sector employment rose by 7.7% in comparison to a growth rate of 2.4% in the formal sector [141]. These groups would theoretically be excluded from such workplace interventions and innovative solutions are needed to develop mental health workforce interventions for informally employed workers in our unique context. The modelling of the cost and implications of workplace mental health interventions has not been undertaken in this analysis and represents an area for future exploration.

Human Rights and Hidden Costs

As outlined throughout this Investment Case, the values driving this undertaking have given equal merit to the intrinsic value of improved mental health and well-being as a worthy goal of investment, independent from the value generated through the financial returns of improvements in economic productivity. Further, these analyses adopt the perspective that improvement in the system of care should not be only guided by containment of costs or cost-effectiveness but balanced by moral imperatives for rights-based, quality care as identified by the Human Rights Commission to correct historical imbalances. As such, the provision of care for behavioural and developmental disorders, severe MNS disorders, as well as alcohol- and substance-use disorders and dementia, in addition to forensic assessment needs and long-term care for state patients, have also been included as fundamental aspects of this Investment Case.

It is important to bear in mind that the field of economic evaluation is rapidly evolving, with an increasing critique of the narrow focus of cost-effectiveness analysis approaches and their limitations in sufficiently capturing all costs and benefits relevant to the assessment of public health interventions. The capability approach advocates that programmes are evaluated based on their impact on the extent to which an individual has the capability to function optimally. A person's ability to maximise their utility is therefore dependent on opportunities and useful options available to them. This approach considers five overarching attributes of capability wellbeing: stability, attachment, achievement, autonomy and enjoyment.

The use of a descriptive system based on dimensions or attributes as an evaluation approach is similar to the Quality Adjusted Life Year (QALY) approach. The quality-adjusted life-year represents a measure of disease burden, including both the quality and the quantity of life lived in which one QALY equates to one year in perfect health, with scores ranging from 1, to signify perfect health and to 0, representing death. The key difference between them is that the descriptive system employed by the

QALY is limited to health dimensions – rather than capability (freedom) to pursue health improvement [142]. Furthermore, the capability approach advocates for a preference-based approach to weight attributes based on individuals' own preferences. Inequality and disadvantage in this regard are mediated by social, economic and environmental constraints [143, 144]. A person's "capabilities" are therefore determined by the opportunities available to them, and their ability and freedom to choose from these opportunities and meaningfully participate in society [143, 145]. Sen himself, in his original conceptualization of how the theory of capabilities could contribute to development, called for progress from different sectors [144], arguing that what is needed is not only more resources (which should be advocated for, but which may always be less than what is needed) but "careful strategic dialogue and action" [146] p 87, between sectors. This relates to shifting the status quo of government departments (notably The Department of Health (DOH) and The Department of Social Development (DOSD)) from working in "silos" and competing for scarce resources.

The estimated investments across all modelled interventions must also be considered in light of the considerable medico-legal claims being brought against the Department of Health in light of poor service quality with the Life Esidemini Tragedy highlighting the significant risk of decentralising services without significant injections in community-service development. The Life-Esidimeni Tragedy has resulted in 135 claims, each of which cost the Department of Health ZAR 1.2 million, amounting to a total of ZAR 162 million. As such, this analysis explores the gradual build-up of community-based residential and day-care services whilst maintaining investments at the hospital level. Whilst only additional bed needs are costed in this analysis, the current quality of inpatient psychiatric units, particularly at the district and regional level(s) speak to a pervasive crisis that needs to be addressed through the rehabilitation of the majority of these units.

The provision of community-based residential- and day-care services has been costed in this analysis, although an explicit additional return on these investments could not be measured. For this analysis residential and day-care services are modelled for a small sub-set of populations living with psychosis and bipolar disorder, as well as intellectual disability and dementia; this service is costed as part of their core treatment package despite estimates of the additional benefits associated with this platform not yet available in our setting. It is acknowledged that community services are required for many of the other MNS disorders, in particular, alcohol and substance-use disorders, but have not been modelled in our analysis due to the absence of data on populations in need and basic service requirements. The community services place emphasis on rehabilitation through the provision of full-time occupational therapists and supervisory OT visits, as well as primary health care nurse visits to residential units for medication delivery, pharmaceutical management and adherence support. A full-time social worker is provided for both

residential and day-care services to establish essential links with the Department of Social Development. In the longer term, these should be expanded to include additional auxiliary and specialist support including physiotherapy, speech therapy and vocational counsellors.

The provision of these services is likely to reduce caregiver burden, improve caregiver participation in the workforce and reduce readmission rates, estimated to account for close to 20% of South Africa's current mental health expenditure. Due to the absence of data, these improvements could not be modelled in the analyses and as such, our returns are again conservative in nature. Whilst the provision of a comprehensive team to provide Assertive Community Treatment (ACT) has not been included in the analysis due to the considerable costs of the model rolled out within the Western Cape, it is anticipated that modelled supervision support by DMHTs includes support to those within community-residential services, in addition to the provision of the monthly professional nurse support. ACT has been found to translate into a 272% reduction in length of inpatient admission (24.7 days vs 67.2 days) as well as a 292% reduction in the number of readmissions (0.41 vs 1.2) [147]. Whilst a full ACT model has not been included, it is likely that at least a proportionate amount of these benefits will be yielded through our proposed community mental health service platform. Furthermore, the provision of rehabilitation has been associated with a 62% reduction in hospital admissions; a 75% reduction in length of inpatient admission [148] as well as caregiver respite [149]; rehabilitation is a key component of the service platform outlined for community-based care.

The shortage of forensic and state patient beds in the country renders a large number of patients remaining in correctional facilities whilst awaiting beds. As of July 2020, the Department of Health reported a backlog of 1,674 forensic assessments and 193 state patients. The shortage of forensic beds has necessitated the adoption of adapted approaches to rendering this service through outpatient assessments and the contracting of private providers to provide the service which has proven successful in a number of settings across South Africa. A study conducted in Limpopo reported that 85% of patients could be assessed on an outpatient basis, and the approach resulted in improved collaboration with SAPS and the Department of Justice and Constitutional Development [150].

A retrospective analysis of clinical records of state patients admitted to forensic psychiatric hospitals in the KwaZulu-Natal province found that 78% [151] of patients assessed were determined not to be fit to stand trial. This translates to a significant number of offenders requiring long term state patient stays, estimated to last between two to five years according to feedback received from the Department of Health. Furthermore, 35.0% and 28.5% of those patients were diagnosed with intellectual disability and schizophrenia. Notwithstanding the human rights obligations of providing care for these groups, the returns-on-investment analyses for these conditions have not accounted for the significant reductions in

offending and the resultant savings likely to be accrued by the Departments of Justice, Corrections, and Health in making care for these groups universally available, acceptable and of sufficient quality, throughout their lifespans'.

Furthermore, the provision of halfway houses should be explored as an alternative to long state patient stays once reclassified, with building costs (excluding land) obtained from the department of human settlements amounting to ZAR 3.4 million. Whilst this estimate excludes the staffing personnel required, it stands in contrast to the exorbitant cost of forensic inpatient facilities, estimated at ZAR 7.36 million. Patients should not be required to stay longer than necessary due to the absence of transitionary spaces for them to reintegrate into the community.

Mental health and its Comorbidities

Data limitations have restricted the ability for this Investment Case to directly model the significant benefits of investing in the mental health system that will be realized for health outcomes of other health conditions. Nonetheless, it is important to characterize both the scale and importance of these potential benefits using available evidence.

The prevalence of hypertension is estimated at 20% [152] of the adult South African population, with projected increases by over 40% in the 35-65 age group by 2030 [153]. An evaluation of primary health care visits across the country showed that visits for hypertension follow up accounted for 10% of all consultations, highlighting a significant burden on the health system [154], whilst a study conducted in Khayelitsha demonstrated that hypertension was the most common comorbidity among adults with TB, HIV, and diabetes [155]. A meta-analysis published in 2020 exploring the burden of depressive disorders across 5,299 adults living with hypertension in South Africa, Nigeria, Ghana, Ethiopia and Burkina Faso determined that the prevalence of depressive disorders among this group was 17.9%; with the prevalence of depressive symptoms estimated at 33% [156]. Results of the World Health Surveys have revealed that co-morbid depression exists amongst 9.3% of those diagnosed with diabetes, as well as a range of other chronic conditions [157]. Furthermore, the prevalence of depression is found to be higher with the existence of two or more chronic physical conditions, estimated as high as 23%. Similar findings are reported for the South African context, in particular with the existence of multiple co-morbidities[158, 159]. Data from the World Health Surveys suggest that people living with NCDs are two to five times more likely to suffer from depression. Mental health has been demonstrated to both compromise prevention and treatment efforts by compromising adherence and self-care, in addition to the fact that through its impact on the endocrine and immune system, depression and anxiety translate to effects at the biological level [160].

The potential extent of comorbidities is also highlighted by drawing from Discovery Health medical claims data obtained from Quantium Health, a data analytics firm with an established relationship with Discovery Health. Analysis of these data (as of February 2020) demonstrates significant rates of comorbidities between MNS disorders and other chronic conditions – both for common mental disorders and amongst those deemed more severe in nature. Amongst Discovery Health members with diagnosed depression, for example, 16% also have a diagnosis of hypertension with 4% having a diagnosis of diabetes. Similar trends are seen among members with a diagnosis of anxiety where 15% and 4% of members also have a diagnosis of hypertension and diabetes, respectively. Among Discovery Health scheme members diagnosed with schizophrenia, 15.5% and 5.2% also have a diagnosis of hypertension and diabetes, respectively; with 14.1% and 4.1% of members diagnosed with bipolar disorder also having a diagnosis of hypertension and diabetes, respectively. Of particular significance, 10.4% and 3% of Discovery members diagnosed with alcohol-use disorder and 20% and 10% of Discovery members diagnosed with substance-use disorder, also had a diagnosis of hypertension and diabetes, respectively.

A meta-analysis of the impact of depression treatment on adherence to anti-retroviral therapy (ART) has found the odds of adherence to ART to be 83% higher with the provision of depression treatment, with greater improvements reported for samples with lower CD4 counts, higher rates of severe depression and interventions specifically targeting depression as the primary objective[161]. Another study conducted in South Africa found that at the time of ART enrolment, 33%, 49% and 33% of patients screened positive for depression, anxiety and substance abuse respectively; the study found that after a 6-month follow up period, the odds of being lost to care was 3.46 and 3.89 among those screened for depression and alcohol use disorder compared to those without depression and alcohol use disorder [161]. The country has seen an exponential rise in funding for its HIV response, with government allocations growing from ZAR 1.2 billion in 2004/5 to ZAR 17.5 billion in 2016/17 [162], rising to ZAR 24.5 billion being allocated in the new budget [163]. Despite this 14-fold increase in expenditure, there remain opportunities to optimise the HIV response to ensure the country meets its targets. Depression compromises anti-retroviral treatment (ART) adherence and virological suppression, thus threatening the effectiveness of South Africa's ART programme. According to the country's latest Thembisa model [164], progress towards achieving the country's 90-90-90 targets have been mixed, particularly with regards to those diagnosed being placed on ART.

With regards to TB, a study conducted within PHC clinics in South Africa found that 81% of patients reported symptoms of distress; other studies conducted in South Africa report rates of depression among TB patients of 46% [165]. Another scoping review found that the risk of contracting TB and alcohol-attributable TB mortality rise with increasing rates of alcohol

consumption, attributing approximately 17% of TB incidence and 15% of TB mortality to alcohol consumption, with the likelihood of TB non-adherence rising on account of heavy alcohol use[166]. The impact of mental health on other comorbid conditions not only exist for infectious diseases, but also for other chronic conditions including hypertension and diabetes A study conducted in Ghana found that the experience of stress increased the likelihood of non-adherence to hypertension medication (2.42 Odds ratio (OR))[167].

Perinatal Mental Health

Perinatal mental health refers to the period during pregnancy and the first year after birth [168]. Depression and anxiety are the most common mental health problems during pregnancy, with evidence demonstrating that approximately 12% of women experiencing depression and 13% experiencing anxiety at some stage, with many experiencing both as comorbid conditions. Depression and anxiety have also been found to affect 15 to 20% of women in the first year after birth [168]. Notwithstanding the economic and individual costs of maternal depression, the intergenerational impacts of maternal depression have been demonstrated, with children of depressed mothers at increased risk for health, developmental and behavioural problems [169]. The high rates of maternal depression estimated in LMICs are influenced by the socio-economic conditions in which many women live, including those characterized by poverty, intimate partner violence, limited control or participation in financial decisions and overcrowded living conditions, with strong evidence demonstrating that maternal depression amongst women experiencing social disadvantage is linked with poor infant outcomes. Furthermore, depression has been strongly associated with suicide and is a leading contributor to rates of maternal mortality globally. Suicidal thoughts or actual self-harm has been found to occur in up to 20% of mothers in LMICs [170].

While a comprehensive assessment of the mental health burden in South Africa remains lacking, including the population-based estimates of perinatal depression and anxiety, evidence is drawn from a number of locally implemented studies as well as globally conducted reviews [171-174]. The prevalence of perinatal depression and anxiety in South Africa exists in the upper bounds estimated for LMICs and has been estimated as 20% for depression and 15% for anxiety among women in the perinatal period. Owing to the significant burden of perinatal depression and anxiety, independent modelling for this sub-population was conducted for this investment case. Addressing maternal mental health provides a critical opportunity for South Africa to address its failings to achieve the Millennium Development Goals, and attain maternal and child health targets established by the Sustainable Development Goals.

There exists a strong evidence base that perinatal depression, the most common form of mental disorder during the perinatal period, can be effectively treated. The effects of psychotherapy have been found to yield comparable effects as compared to the provision of pharmacological treatments; the provision of both however has been determined to be more effective than either intervention in isolation [175]. A range of effective psychological interventions for treating depression during the perinatal period include cognitive behavioural therapy, interpersonal therapy and group psychoeducation; these interventions have been demonstrated to reduce symptoms of depression as well as improved compliance with treatment and attendance at health care facilities [176]. While reductions in maternal depression in and of itself are necessary but not sufficient for preventing negative child outcomes [177], trials undertaken globally and in the South African context have included services to address the mother-infant relationship, infant health and emotional, social and cognitive development through improvements in maternal knowledge and caregiving skills [176]. Such interventions have demonstrated improvements in maternal functioning, mother-infant bonding, as well as infant cognitive, social, emotional and physical development [178, 179].

Furthermore, an emerging evidence base exists in LMICs relating to the effective interventions provided through non-specialist settings [180]. Recommended by the Word Health Organisation, the Thinking Healthy Programme [178] offers cognitive behaviour therapy delivered by community health workers for mothers with perinatal depression and has demonstrated that it can improve infant outcomes, including diarrhoea and immunisations. Task-shifting programmes, including those that utilise trained community health workers (mentor mothers), have been also trialled in South Africa [181-184]; and have already proven to be cost-effective for the treatment and support of women with HIV [185].

It is worth noting that while a recent trial of a brief-tasked shared psychological treatment intervention in South Africa did not find a significant difference across intervention and control groups [186], the poor quality of training and supervision were explanatory factors for this outcome. Building on the previous learnings, a significantly expanded intervention has been developed, focussing on improving training processes [40], through which CHWs will be delivering a problem-solving therapy intervention to perinatal women; this intervention is currently being trialled in South Africa. The South African ROI reports significant returns-on-investment through the delivery of interventions addressing perinatal depression, though it must be mentioned that a significant injection of resources specifically for a dedicated training programme for CHWs and Outreach Team Leaders must accompany the adoption of these interventions, as outlined in the training component of this report.

23.

Implementation Considerations & Constraints

Towards an Essential Benefits Package for Mental Health

This Investment Case provides a synthesis of the increasing burden imposed by mental, neurological and substance-use (MNS) disorders and quantifies the burgeoning cost of inaction in addressing these conditions on the economy and population well-being. The analyses contained herein also provide an explicit treatment package to be provided at each level of care to address population needs, thereby acting as a tool that the development of the NHI benefits package can draw on.

When reflecting the budgetary implications of the modelled package of interventions for MNS disorders in the country, total investments on facility-based treatment and rehabilitation interventions (including all non-capital service costs for community-based residential and day-care platform(s)), represents an average of 0.46% of the country's current GDP, per year of scale-up. Our current GDP represents a significantly contracted economic climate on account of the COVID-19 pandemic, contracting by -

7.2% [187], though the National Treasury anticipates real economic growth of 3.3% in 2021, levelling to 2.2% in 2022. Our analysis estimates a conservative 1.6% GDP growth over time and provides an alternative return-on-investment analysis aligned to this projected growth.

Furthermore, the scale-up of services for MNS disorders is expected to contribute to economic recovery, both on account of a healthier workforce in the country as well as through infrastructure investments, anticipated to contribute to job creation in the country. Currently, South Africa loses an estimated ZAR 161 billion on account of the burden of MNS, translating to 4% of the country's current estimated GDP. When accounting for all treatment based costs as well as programmatic needs, (excluding infrastructure as these capital costs have not been annualized over 30 years), expenditure for the first year would translate to ZAR 448 per capita. The average annual cost over the scale-up period would translate into approximately ZAR 313 per capita based on the estimated population in 2035. In comparison, the country's allocation of ZAR 24.5 billion in 2021 towards HIV, AIDS and STIs sub-programme translates to an estimated expenditure of approximately ZAR 410 per capita.

Global criteria have been outlined by the World Health Organization for decision making toward the establishment of an essential benefit package (Figure 13)[1]. These criteria have been realised through this Investment

Burden of disease	The health loss from diseases, injuries and risk factors at the population level; it is usually expressed in a measure that combines morbidity, mortality and disability
Balance of benefits and harms	The balance of health benefits and harms reflects the health impact of an intervention on individuals or populations
Cost-effectiveness of interventions	The value-for-money of the intervention (usually expressed as a ratio of the costs of the intervention to its benefits).
Equity and priority to the worse off	A qualitative or quantitative measure of the ability of the intervention to address existing inequalities in the health system
Financial risk protection	The extent to which individuals, households or communities can afford the cost of the intervention and are protected from catastrophic health expenditure and health-related financial risk
Budget impact and sustainability	A measure of the resources needed to implement the intervention. For budget impact this is the overall financial implications of implementing the intervention for the available national health budget
Feasibility	The extent to which the intervention can be delivered through the existing health system taking into account available human resources, infrastructure and other resources and whether it is socio-culturally acceptable to the public
Social and economic impact	The societal consequences resulting from the intervention, for instance in terms of stigma, societal cohesion; as well as the broader economic consequences, such as national development and poverty reduction goals.
Political acceptability	A measure of the acceptability to the decision makers

Figure 11 Criteria for Essential Health Benefit Package Decision Making
Principles of health benefit packages. Geneva: World Health Organization; 2021.
Licence: CC BY-NC-SA 3.0 IGO [1]

Case as follows: (1) the health and economic losses due to MNS conditions are quantified; (2) cost-effective interventions are considered for scale-up; (3) services are reoriented towards increased primary health care service provision in an attempt to address inequalities in the health system; (4) motivating for the adoption of these interventions in the benefits package is required to ensure increased financial protection; (5) the impact on the budget is determined; (6) the feasibility of scale-up with the consideration of essential programmatic enablers is explored; (7) a range of social and economic impacts of these interventions are quantified; and (8) the inclusive process for the development of this investment case has aimed to ensure political acceptability.

The level of financial protection with regards to accessing essential health services in the country compromises progress towards UHC. In an assessment of the household economic costs due to depression, practices such as reducing food expenditure, and resulting decreases in capacity to pay for household resources, and increases in the presence of household debt, were all associated with increased severity of depression symptoms amongst households in which a member was affected by depressive symptoms [188]. Additionally, data analysed among Discovery Health members found that even amongst the insured population, a significant proportion of out of pocket expenditure is consumed when accessing care, with rates ranging from 18% for schizophrenia, 23% for bipolar disorder and 25% and 27%, respectively, for depression and anxiety; rates as high as 52% of out of pocket spending was quantified for scheme members living with alcohol- and substance-use disorders.

Fiscal Space

Baseline estimates of those receiving care in our analyses translate to an estimated coverage of 6.43%, with a total budget envelope for service delivery estimated at approximately ZAR 7.7 billion. Based on the formative costing study, an estimated ZAR 8.37 billion was spent on mental health services in 2016/17, amounting to a net present value of ZAR 7.7 billion. This falls closely within our estimates for normative service provision at baseline in the absence of the additional programmatic costs, relating to training, planned patient transport and the required governance structures, as well as costs associated with capital infrastructure.

It is acknowledged that fiscal constraints may not allow for the adoption of all interventions, even if return-on-investment is a critical element of decision-making. In a constrained scenario, in which one does not estimate any additional budgetary space available for mental health service delivery, this level of coverage across all MNS disorders would be maintained. To scale up coverage in the absence of additional budgetary contributions, priorities would need to be established for which interventions (and related target populations) could be scaled up,

according to the estimated costs of service delivery and their demonstrated returns-on-investment. It is possible to increase coverage for common mental disorders, but there lies an opportunity cost in such an approach, in which service scale-up for severe MNS disorders, alcohol and substance-use disorders as well as childhood behavioural and conduct disorders, intellectual disability and dementia remains inadequate. A balanced approach that takes into account both economic returns and human rights is required to ensure equity between MNS disorders in care provision.

Intersectoral Action and Financing

The social determinants of mental health have been well-established, and there is a growing body of evidence on the effectiveness of interventions addressing these upstream factors[189]. Insufficient recognition of the cross-sectoral benefits of population mental health and well-being has resulted in a continuation of many Departments adopting a singular focus on their own sectoral objectives with siloed resource allocation mechanisms. Exploring mechanisms to pool budgets across sectors could support the use of resources more efficiently. For example, there is clear evidence that education and school completion is an important protective factor for mental health – thus interventions to reduce school dropout and improve the quality of education have the potential for important mental health benefits. Under such co-financing approaches, the total cost of interventions, along with their multi-sectoral outcomes would be shared across sectors. Furthermore, leveraging funding from other sectors could offset global development assistance for health and optimise the nature of public spending in the country. The adoption of cross-sectoral financing models have taken off globally, however, the potential of such strategies and institutional feasibility has yet to be explored in South Africa.

Addressing the social and non-biological determinants of mental health requires the implementation of policies and programmes outside of the health sector; with this in mind and in alignment with the country's MHPF, this analysis attempted to include the roles and related costs for other relevant departments as much as data could allow, although it is acknowledged that this does not provide a comprehensive assessment of all potential Departments that should be considered or even the particular interventions that could be provided across sectors. The large majority of costs quantified in this analysis relate to screening, detection and management of MNS disorders, and as such, fall within the budget and mandate of the Department of Health. The Department of Social Development's mandates within costed interventions in this analysis include the support of substance abuse centres following detoxification by the Department of Health, the provision of subsidies and support to services catering to individuals with mild intellectual disability. The Department of Education has co-shared mandates with the Department of

> ***"We had a meeting with our first Mental Health Forum that we established. We just met one time to develop ground rules. Social development said it's not our business and they are upfront that they do not have any facilities that they subsidise and that cater for mental health users. The nature of the business and what they subsidize as entities are for physical ailments and for the elders"***
>
> *Multisectoral Provincial Workshop Participant, 2019-20*

Social Development in the support of centres for early childhood development, as well as the provision of services within schools for children, considered through the universal and indicated social-emotional learning interventions modelled. The Department of Human settlements has the mandate to provide special housing for key populations, which include those living with MNS disorders, and their costs are considered through the capital infrastructure required to build residential units, halfway houses and the potential to support the construction of substance-abuse rehabilitation centres. The Department of Correctional Services holds a shared mandate to provide services for forensic patients, with the potential for the provision of long-term stay for state patients falling within the mandate of the department health. The significant cost estimated to meet the country's long term state bed needs is significant however, and ensuring sufficient community support post-discharge, including through the establishment of halfway houses for parolees, providing ongoing support related to substance-abuse[190] and enuring employment opportunities, may address high rates of recidivism. Of key importance is the maintenance of ongoing medical support to licensed NGOs with treatment and rehabilitation staff to support residents' ongoing care needs.

An examination of innovative financing models implemented across LMIC contexts [191] found that the majority of co-financing models include the Health, Social and Education sectors as pioneers of co-financing success. Interventions were either implemented and governed by a single sector or delivered in an integrated fashion ensuring cross-sectoral accountability. The key enablers of the success of such approaches included resource availability and political relevance, while the absence of clarity around the roles of different players and the objectives of pooled funding served as barriers. Overall, however, positive process measures were reported, speaking to the potential of co-financing approaches to achieve positive outcomes.

A key goal of NHI is to overcome the fragmentation, costliness and inefficiency currently existing within the country's health system. This will require the establishment of structured relationships between sectors towards unified goals; financing mechanisms that will allow for joint budgeting and investment into community-based services; and inclusive district-level governance that draws away from the traditional, verticalized service approach that currently challenges mental health service

provisioning. While it is acknowledged that the creation of co-financing mechanisms is complex and requires planning, in the short term increased intersectoral collaboration and communication is required. While provincial engagement identified successfully established intersectoral forums that facilitated at the micro-level, many reported challenges with the consistency of attendance and limited decision-making autonomy is given that senior-level departmental representatives remained absent at large from these meetings. Furthermore, many provincial participants called for increased training across sectors to increase awareness related to each sector's mental health mandate and improve support systems across collaborating sectors.

Successful implementation of community-based mental health care will require strengthened governance structures across relevant departments. Whilst lead government departments include the Department of Health and the Department of Social Development, there remains vagueness and overlap in service provision that requires clarification. The complex nature of mental illness renders the buy-in from a range of additional government departments increasingly important. This requires the inclusion of the South African Police Services to operationalise their legal mandate to assist in transporting people requiring admission to care. This will require improved policies and procedures, and dedicated funding for police officer training in managing psychosis in different contexts. Furthermore, the support of the Department of Rural Development and Land Reform will be required to secure properties that can be converted to NPO-managed mental health residential and/or day care facilities.

Existing Financing Mechanisms

It also bears mentioning that several funding commitments have been made in the country through the establishment of conditional grants which either directly or indirectly make provision for the financing of a number of actions proposed within this Investment Case, across sectors.

An allocation of ZAR 319.8 million and ZAR 493.06 million has been allocated for the 2017/18 and 2018/19 financial years to enhance the implementation of the country's ECD policy through the Department of Social Development [192]. This grant allows for ongoing support both for subsidy provision and the maintenance of such centres. Furthermore, there exists a series of additional conditional grants within the health sector from which the required investments in this analysis can draw on [193].

In the budget vote, the National Treasury has committed to providing increased investments towards community outreach services, which is anticipated to go towards harmonising and standardising the training, performance monitoring and remuneration of community health workers.

As such, ZAR 5.7 billion is allocated over the MTEF period within the HIV, AIDS and STIs sub-programme.

Treasury has also committed to investing ZAR 23.5 billion over the MTEF period in health infrastructure through its two infrastructure conditional grants in the Health Facilities Infrastructure Management subprogramme in the Hospital Systems programme. The Health Facility Revitalisation grant, allocated to Provincial Departments of Health, amounting to ZAR 19.2 billion over the MTEF period, is expected to contribute towards 1,500 infrastructure projects, including new facilities, upgrades, refurbishments and maintenance. This grant is intended to be supplemented by the Health Facility Revitalisation component of the National Health Insurance Indirect grant, managed directly by the National Department of Health, on behalf of provinces (an allocation of R4.3 billion over the same period). Through these initiatives, there has been a commitment to increase spending in the Health Facilities Infrastructure Management subprogramme at an average annual rate of 6.9%, from ZAR 6.9 billion in 2018/19 to ZAR 8.5 billion in 2021/22. Furthermore, in support of equitable access to tertiary health care services, the Treasury has recognized that such services are highly specialised, and require strong National coordination due to their unequal distribution across South Africa. This results in many patients receive care in neighbouring provinces; this is seen in the case of Mpumalanga that is yet to see a specialized Psychiatric hospital established. The country's 29 tertiary hospitals are supported through the National Tertiary Services grant to support provincial departments that manage patients from other provinces. Lastly, to fund medical specialists, equipment, and advanced medical investigation and treatment, the grant has been allocated ZAR 13.2 billion in 2019/20, ZAR 14.1 billion in 2021/22 and ZAR 14.8 billion in 2021/22 in the Hospital Systems programme[163]. Furthermore, the interfacility transfer costs for patients moving from acute to long term care may be financed through Emergency Transport Services.

> ***"Mental health was feeling like its first time it's getting a grant but then it's taken and then it's been sent to HR and then you don't see any appointment in mental health sector when it was here"***
>
> *Multisectoral Provincial Workshop Participant, 2019-20*

Abilities for provinces to access these grants and ensure that sufficient planning is in place to ensure that budgets are not underspent will be critical. It is recognized that in this fiscally constrained environment, with a zero-budgeting approach being adopted, annual reviews of budgets and their expenditure to both support fiscal rigour and increased efficiency in the allocation of expenditures is necessary. The reallocation of any budgets should both ensure that it does not harm the provision of constitutionally mandated programmes, but should also pursue efficiencies and reforms in the operational modalities of those programmes.

Emerging Global Opportunities for Mental Health Financing

It has been well established that the growing burden of noncommunicable diseases (NCDs), are increasingly affecting millions of people worldwide, including in South Africa, with over three-quarters of these deaths occurring in low- and middle-income countries, dealing with concurrent infectious disease epidemics and high maternal and child mortality and morbidity. The large and sometimes avoidable costs are imposed on already overstretched government budgets. Until recently, however, the global development agendas for NCDs have not emphasised the urgency for increased resource mobilisation for NCD prevention and control, limiting mobilisation for increased country-level actions and perpetuating the inequality between its imposed burden and domestic resources to address it[194].

To support countries towards achieving the SDG targets, in particular, SDG 3.4 (to reduce by one-third pre-mature mortality from NCDs through prevention and treatment, and promote mental health and wellbeing), the WHO Independent High-Level Commission on NCDs' is motivating for the establishment of a multi-donor fund, 'to catalyze financing for the development of national NCDs and mental health responses and policy coherence at country level'[195]. There exists widespread support for the establishment of a Catalytic Multi-Donor Trust Fund for the Prevention and Control of NCDs and Mental Health (NCD MDTF) to provide predictable, multilateral and multi-year funding to provide momentum towards the scale-up of domestic resourcing for NCDs and mental health. The five focus areas agreed upon for such an initiative align with the move towards the integration of NCDs and mental health within ongoing health system strengthening activities.

- National investment frameworks for NCDs and mental health
- Establishment of pro-health partnerships and policy coherence
- Stronger legislative and regulatory environments, supportive of a healthy and prevention-focused approach
- Stronger health systems – scaled up access
- Community-based and population-wide responses

The NCD MDTF aims to mobilize between USD 200 – 300 million, to support 25 countries over a span of five years, with seed capital aiming to leverage additional resources through domestic and private sector investments for NCDs. In addition to demonstrated demand and need, the level of financial risk protection and demonstrated country commitment towards increased domestic resourcing (through the development of national NCD strategies accompanied by investment cases. As such, the development of this Investment Case provides a critical resource for which government can engage with such international funding opportunities.

Infrastructure Constraints

The analysis identifies severe infrastructure constraints to achieving the required scale-up of services, particularly at the district and regional hospital levels. While the analysis modelled an optimistic scenario of significant investments in mental health inpatient units at these levels, it is acknowledged that infrastructure planning is likely a multi-year endeavour, and therefore, ensuring increased service access at the district and hospital levels in the short term will not be possible. Furthermore, the analysis adopts a scenario in which legislative changes allow for district hospitals to provide acute inpatient services beyond the 72-hour assessment period so as to limit the burden on transfer services, acknowledging infrastructure limitations, particularly in rural areas. Whilst it is acknowledged that the 72-hour admission period only relates to involuntary admissions, the analysis assumes the large majority of acute admissions meet this criteria. It is however recognized that such legislative changes may take time to implement. It is important to note that in practice, due to the absence of beds at higher levels of care, patients de-facto remain at the district hospitals beyond the 72-hour assessment periods, estimated at an average of 8 days due to the absence of MHRB capacity and the burdensome nature of preparing the documentation required for involuntary admissions. There remains surplus bed capacity in our analysis at the centralized and psychiatric hospital levels; for the latter, this residual capacity remains despite the scale-up of services. However, it is important to note that such capacity is modelled according to normative assumptions on the average length of inpatient stay, and it is known, from the formative costing study that lengths of stay are far longer due to limited options for service provision upon discharge. As such, this excess capacity modelled is likely untrue, as most long-term inpatient beds remain full in our current service landscape.

Human Resource Constraints

> ***"Those teams are there but the challenge is how they are performing. Because for WBOTS for them to be functional, you must have a team leader, now what they do now currently, is they are dependent on the professional nurse at the facility which means most of the time, they are just coming, nobody is actually supervising their function because there is nobody who is going out into the community with them, to get check if they are getting these people. They are there. They are beautiful on paper."***
>
> *Multisectoral Provincial Workshop Participant, 2019-20*

The severe lack of specialised mental health personnel in the country necessitates the increased provision of mental health services by generalist health workers and promotes increased integration of mental health care with other services, particularly at the primary care level. Owing to the significant rates of comorbidities, this strategy is intended to promote reduced mental health stigma and increased efficiency of service delivery. This aligns with the country's strategy to integrate HIV and TB services at the

PHC level, announced in 2012 [196]. The success of integrated service delivery is however contingent on a number of health system factors as evidenced by an evaluation in 2019 across primary health care facilities in Durban (KwaZulu-Natal) reporting that out of ten sampled facilities, only 20% had established a fully integrated model[197]. Cited challenges to successful implementation included insufficient infrastructure related to the availability of consultation rooms, staff shortages, insufficient capacity building and training - exacerbated by long periods between rotations limiting opportunities for practical skills building, drug stock-outs, and a lack of advocacy, communication and social mobilisation to increase community demand for integrated services. The previously published formative analysis of current mental health expenditure and resources in South Africa [11] revealed drug stock-outs for the large majority of modelled disorders across all levels of care, including at the PHC level; this represents a significant bottleneck to service delivery.

The task of estimating current resource availability across South Africa's public health system faces considerable challenges, including the need to reconceptualize our current information systems for planning and a lack of a regulatory framework to ensure oversight across human resource regulatory authorities. As such, comprehensive information relating to the availability of personnel according to medical and nursing specialities was not available for a comprehensive human resource constraint analysis to accompany modelled interventions. The severe maldistribution of health personnel across provinces, notwithstanding those that exist between the public and private sectors, compounds absolute shortages in key health personnel across the country. This is against the backdrop of freezing of posts in an attempt to control personnel costs, resulting in the total number of filled posts in the provinces declining by an average of 0.5% per year since 2012/13 [198]. Unsurprisingly, the Human Resource Strategic Plan also notes that in comparison to a density of 0.38 psychiatrists in the public sector, the private sector reports the availability of 4.98 psychiatrists per 100,00 population[199].

Promisingly, the expanded scope of practice for staff (enrolled) nurses and the re-invigorated recognition for the essential role of CHWs, with the National Department of Health formalizing their scope of practice in 2018 and commitment to increasing their minimum stipend to ZAR 3,600, holds some promise. A recently conducted investment case for CHWs in South Africa estimates that expanded employment for CHWs would result in approximately ZAR 13.6 billion injected into the economy over the first three years of implementation, with an additional ZAR 413 billion added over ten years as a result of improvements in the health status of the population [200]. Nonetheless, the country still reports approximately 50,000 CHWs, and incomplete coverage of outreach team leaders, essential for supervision and service quality provision; the CHW investment case estimates that over 96,000 CHWs would be needed for appropriate coverage, translating to an additional ZAR 6.8 billion over the current expenditure for this platform.

In an attempt to maximize the possibility of service delivery, Staff Nurses are modelled in this Investment Case to provide a large majority of counselling sessions for common mental disorders (including their associated training needs), with expanded use of BPsych Counsellors and Occupational Therapists to provide counselling for children and services for severe mental health disorders. It is important to mention that the role of BPsych counsellors in South Africa remains contested, limiting their integration within the health system. Notably, the 4-year Bachelor of Psychology (BPsych) degree was launched in 2014 to develop a workforce with which to address the mental health needs of the country at the community level. Graduates (also referred to as Registered Counsellors) are trained to deliver psychosocial support, mental health counselling and psychoeducation, and are recognized by the Health Professions Council of South Africa [82]. At present, only posts for Clinical Psychologists have been made. Limited employment opportunities for the BPsych cadre have resulted in declines in the popularity of training programmes and severely affects the potential of cost-effective scale-up. It is worth highlighting that the COE for a BPsych counsellor is ZAR 659,727 annually, whereas the COE for a clinical psychologist is close to double, ZAR 1,132,061, speaking to a significant opportunity to curb costs and prioritize clinical psychologist input for specialist supervision and training roles in support of the PHC level.

Policy & Legislative Constraints

> ***"The process of licensing, it takes a lot…our NGOs, they're not licensed, they're still running with NPO but they are under our observation because we sent out staff there to see some. So now we called them, we did workshop with all the NGOs which we managed to get hold of… it was a full room. It was collaboration with social development and health. Everybody got to be presented with the licensing guideline and then they were told because before you get licensed you must apply to be licensed and when you apply, there must be certain documents you must present. Now people are still battling to get those documents now. I haven't received any applications…"***
>
> *Multisectoral Provincial Workshop Participant, 2019-20*

The current legislative environment governing the provision of mental health services may need to be reexamined in support of increased efficiency and feasibility of service delivery. This includes *Policy Guidelines For The Licensing Of Residential And /Or Day Care Facilities For Persons With Mental Illness And /Or Severe Or Profound Intellectual Disability*. While it is acknowledged that minimum criteria to ensure patient quality are required, the criteria may need to be revisited upon consultation with provinces and NGO stakeholders involved in service delivery. An important consideration in the wake of the Life Esidimeni tragedy is that NPOs providing residential and day-care services are not health facilities, and as such should not be regulated by the same standards as hospitals or old-age homes. There is a pressing need to develop a rigorous but realistic set of regulations that can be set by the

Government to ensure that proper standards are followed in community care facilities.

Whilst infrastructure needs for the hospitals have taken into consideration the baseline availability in the country, this approach was not taken with community residential- and day-care infrastructure needs in this Investment Case. With limited data on existing infrastructure to support these services, capital needs for our community-based service platform have been enumerated based on a zero-baseline scenario. It is acknowledged that there are currently a number of facilities that have been licensed by the Department of Health. Furthermore, there are a large number of NPOs licensed under Social Development that are currently providing services, and upon the recommendations of the Human Rights Commission, many are under assessment. It has been acknowledged across provinces however that these licensing criteria will render the large majority if not all of the NGOs and NPOs currently registered, ineligible, as the criteria developed are very resource-intensive and essentially envision the running of such facilities as mini-clinics. Considerations for reform of these regulations is essential if the NGO sector is to fulfil its important role in the provision of community-based mental health services.

Furthermore, similar to the Nurse Initiated Management of Antiretroviral Treatment (NIMART) policy rolled out in South Africa since 2010 that has enabled decreases in the time to initiate patients as well as reducing loads on referral facilities, considerations for *rescheduling Selective serotonin reuptake inhibitors (SSRIs)* to allow for nurse initiation of antidepressant and anti-anxiety medication, where indicated, should be considered. This decision must be accompanied by standardized training, sufficient monitoring and supervision to encourage nurse confidence in service provision.

> ***"We need changes in legislation for District hospitals to have longer stays and not have mental health in the APP [Annual Performance Plan] of Hospitals for MH Users without recognizing unavailability of upward referall beds. There are three indicators on the APP – all efficiency indicators which are: average length of stay, bed utilisation rate and it is the cost division. Average length of stay means the days that the patient spends in the hospital. For acute facilities like ours, it is three days maximum…My point is; this patient who is staying more than 72 hours they violate those three efficiencies"***
>
> *Multisectoral Provincial Workshop Participant, 2019-20*

Through technical consultations through this process, it has been recommended that both District and Regional hospitals be used for acute

admissions, given the challenges with patient transfers and limited bed availability across levels of care. This model has been used in this analysis, however, will require legislative changes around the 72-hour assessment period for involuntary admissions at the District hospital level to allow for longer stays, which in practice is already happening due to unavailability of beds at higher levels of care, or compromising patient service quality and readmission risks due to premature discharges. With regards to Forensic services, allowing for outpatient psychiatric forensic assessments rather than the required 30-day inpatient observation and potentially reducing the length of time for which state patients must remain in care (currently estimated to range between 2-5 years) before reclassification could also be evaluated in light of the significant cost savings associated with the costs of bed requirements in such facilities.

The Need for Innovation in Mental Health Service Delivery

Significant human resource constraints in South Africa speak to the need to consider innovation in mental health service delivery. The stark interprovincial variation in staffing that currently exists, may be addressed through the use of community service graduates, particularly in rural areas, increasing Public-Private partnerships to make use of their well-resourced staffing platform, and the use of telemedicine and new technologies. A new report released by the Lancet suggests that telemedicine could be key to closing the mental health gap within the continent [201]. During the COVID-19 pandemic in South Africa efforts by organizations including the Psychological Society of South Africa and the South African Depression and Anxiety Group have included the provision of telephonic and virtual counselling to schools, victims of GBV, health care workers and community members [106].

The National Treasury has emphasized that in support of the country meeting its National Development Plans, a stronger and more competitive infrastructure base is required. Improved use of well-managed public-private partnerships (PPPs) may lend itself to increased rigour in project assessment and accountability, whilst allowing for the opportunity to draw in private financing for public infrastructure projects. The Infrastructure Fund that was first announced in 2018 provides a platform from which increased partnership can be built through a blended finance approach. There exists in the pipeline a number of economic and social projects expected to be developed through Public-Private Partnerships (PPPs). A new regulatory framework has been developed by the National Treasury to improve the effectiveness of such initiatives and incentivise increased participation by the private sector[187].

The Global COVID response has demonstrated that successfully containing the pandemic can only be achieved through a coordinated and integrated response that draws on the resources across both public and

private health sectors working towards a unified national interest. Many countries have enabled this through significant changes in the governance and structure of partnerships related to health care delivery. For example in Spain, the government took over the management of all hospitals and health care providers, enabled fourth-year medical students to participate in health care delivery, and negotiated with companies producing medical equipment or partner with the national government in the delivery of needed resources. Similarly, in Ireland, the private hospitals and their health workers were drafted into the public health system.

Such coordination in South Africa is vital to draw on the vast resources of the private sector, with efforts being ignited on account of the pandemic. The competition commission has released a block exemption for the health sector in an effort to promote better coordination, the sharing of information and the standardisation of health practices across the country's health sector. This exemption is intended to encourage agreements between the National Department of Health and the private sector to make the additional capacity available in the private sector available to the public. Furthermore, the Department of Health along with the Department of Trade and Industry has engaged with a range of national interest groups including business entities, medical aid schemes and private hospital groups, professional groups such as the South African Medical Association, and regulatory authorities such as the South African Health Products Regulatory Authority, the Health Professions Council of South Africa, the Pharmacy Council and the Council for Scientific and Industrial Research. Coordinating entities, "command and nerve centres" have been established, including participation from the President's office as well as provincial and municipal entities; such structures have now been given the legitimacy required to be able to effectively prioritise and coordinate resources. Similar agreements will be required moving forward; of critical importance will be the participation of all key stakeholder groups and the establishment of transparent decision making that is accessible for public comment and appeal.

This experience has represented a pilot from which a national unified health platform has been tested, and has demonstrated that the effective removal in the separation between public and private health service delivery systems can achieve an optimal national response and address population needs. These lessons can be applied moving forward with regards to scaling up the country's mental health response, a priority that has emerged across the public and private sectors alike. Furthermore, explicit roles and engagement from private providers, health facilities workplaces and traditional health providers will be instrumental in establishing formal referral networks, to enable successful referrals to care.

Limitations

The limitations of the analysis have been outlined throughout the discussion section and overall Report. A brief summary follows to outline high-level limitations that bear consideration:

As mentioned, although projected levels of overall prevalence were obtained from the Global Burden of Disease Study, it is likely that such estimates do not provide an accurate reflection of the true burden, particularly for common mental disorders in the context of the COVID-19 pandemic. Furthermore, as discussed, current information systems do not allow for an accurate reflection of treated prevalence. Our approach has been informed by technical consultations and estimations of overall coverage, with the understanding that the coverage for severe mental health disorders is likely higher than that for common mental health conditions. The analyses conducted allows for a gradual increase in coverage; for this to effectively take place, political commitment, resource mobilisation and a significant reorientation of services, particularly at the primary health care level will be required. Weak implementation of modelled treatment programmes, including the management of recurrent cases and insufficient promotion and awareness programmes will limit the number of cases being reached and the modelled health and broader benefits estimated by this Investment Case

The paucity of evidence related to the effect of treatment on labour force participation and productivity represented another limitation to this analysis. As much as possible, such estimates were used from local assessments, but outside of common mental disorders and substance-abuse, those estimates were not readily available. More broadly, the population health modelling tool used for this analysis (the UN OneHealth tool) relied on a large number of input parameters across various data sources and assumptions related to expected incidence rates of conditions, demographic changes and the intervention effects expected in the future, thereby limiting their precision. The data were validated as much as possible using South African specific data but did have to rely on regional input parameters when country-specific data could not be obtained. Furthermore, the tool has not yet been updated to include the broader spectrum of condition priorities modelled in this analysis, and therefore many conditions had to be superimposed onto those developed for modelling for us to undertake this analysis. The OneHealth tool will require increased investments to incorporate the additional updates required for modelling of a comprehensive package of mental health services with significant training requirements to allow for its increased use across decision-makers.

As outlined throughout, several effects could not be included in this endeavour, including the impact of addressing perinatal depression on early child development, for which strong evidence exists. Similarly, the

monetary and non-monetary impacts of effective treatment on the broader familial and caregiver economic and health outcomes has not been estimated. Similarly, the potential for treatment interventions addressing depression and anxiety as well as risky alcohol and substance abuse on other chronic and infectious diseases has not been estimated. The analysis does not account for the regular co-morbidity between depression and anxiety, allowing for significant synergy between the treatments for both conditions and reductions in costs; achieving positive health and economic outcomes across comorbid cases may be slower or more challenging to achieve, however.

The analysis could also not account for the impact of socio-economic status as a predictor of the modelled health and economic outcomes; there remains limited evidence on the impact of mental health interventions targeted towards disadvantaged populations [202]. Barriers to accessing services experienced by the poor, including the costs of accessing care, both through transport and the cost of paying for services are critical, therefore making it vital that these services are decentralised and provided as part of the minimum prescribed benefits within the broader NHI plans of the country. The impact of workplace mental health services could also not be included in this analysis, although it is recognized that the workplace environment itself is a source of stress; it is paramount that mental health and well-being programmes be provided within existing employee support programmes. The potential for rolling out digital interventions in light of human resource limitations have been explored but could not be modelled in this analysis. Furthermore, the role of traditional healers and inputs from service users directly (beyond the leadership of their user groups) remains a gap and should be explored in further work. It is also important to note that the analysis did not model interventions addressing suicide or Post-traumatic stress disorder (PTSD) directly, although they are closely linked to the experience of depression and anxiety, as well as risky alcohol and substance-use. Autism was also not modelled given the lack of evidence relating to the impact of interventions addressing this in children and adults, particularly in low resource South African settings.

Furthermore, the analysis does not model interventions addressing suicide, which represents a significant concern in our setting. According to the 2010 GBD study, mental and substance use disorders were responsible for 22.5 million of the 36.2 million DALYs attributed to suicide in 2010. Depression was responsible for the largest proportion of suicide DALYs (46.1%) [203] Data from the GBD 2017 found that people with a diagnosis of depression have a relative risk of suicide of 19.9; this indicates that people with depression are 20 times more likely to die from suicide relative to those without depression[204]. A review undertaken across LMICs to determine the relationship between suicide and suicide attempts found that 58% of those who die by suicide met the criteria for a psychiatric diagnosis, while 45% of those with a psychiatric disorder attempted self-harm. Mood disorders were most prevalent in both suicide

and self-harm[205]. Data from the South African National Injury Mortality and Surveillance System indicates that a significant proportion of all non-natural deaths are on account of suicide. Strong predictors of Non-fatal suicidal behaviour (NFSB) include being gender, with larger proportions reported amongst females, being single, younger age, a history of suicide attempts, family history of mental disorder, alcohol or drug abuse, limited schooling, unemployment, and having a psychiatric disorder[206]. A publication by Cummins RR et al [207] reported that NFSB made up approximately 10% of psychiatric referrals amongst children and adolescents, with peak incidence among 13-year-olds and a female to male ratio of 2:1.

A retrospective study of patients referred to a hospital in Bloemfontein for psychological evaluation between 2005 and 2006 reported that the majority of patients were female (68.9%), with a median age of 22 years. Risk factors associated with patients who attempted suicide included problematic relationships (55.4%), financial problems (22.9%), psychiatric problems (22.1%), arguments (19.8%), abuse(18.2%), low self-esteem and hopelessness (16.7%), as week as recent life changes (13.2%).[208] Another study conducted amongst patients admitted to a hospital in East London between 2009 and 2010 reported that the majority of patients were between the ages of10 and 20 years (40%), while 38% of patients who attempted suicide were between the ages of 20 – 30 years (38%).

The analysis does not account for cost savings to the health sector on account of reductions in suicide attempts. These would be particularly pertinent for interventions addressing adult and childhood depression, including through the provision of SEL programmes, in addition to interventions targeting individuals with alcohol and substance-use disorders. The total number of suicide attempts can be estimated by dividing the total number of suicides by the case fatality proportion among suicide attempts. The case fatality proportion among all suicide attempts by adolescents was estimated to be 5% based on studies undertaken in LMICs[209, 210]; this rate is likely far higher amongst adults. The total cost of treating suicide attempts was estimated by multiplying the total number of suicide attempts by the average cost per suicide attempt. The average cost per suicide attempt can then be calculated as the total cost of hospital inpatient days estimated for suicide attempts; this data was not readily available for our context.

With regards to infrastructure needs, specific bed needs for children and adolescents have not been modelled, as the majority of services modelled for which evidence is available relates to the provision of care for individuals over the age of 15. Furthermore, for unique services targeted at children, including family psychoeducation for ADHD and conduct disorder, as well as the provision of services for intellectual disability, all services are provided on an outpatient basis. Strong recommendations emanating from the Delphi study, as well as findings from the formative costing study point to a virtual absence of inpatient beds for children and

adolescents, in addition to extremely limited availability of child psychiatrists across the country.

A qualitative synthesis[211] across key stakeholders involved in child and adolescent service provision in the Western Cape highlighted the lack of dedicated budgets for child and adolescent mental health services (CAMH) both at the national and provincial levels. Participants recognized that the Western Cape was far more advantaged than other provinces with regards to service provision for children and adolescents, and housed three well-structured tertiary CAMH units, including Lentegeur Child and Family Unit (linked to Stellenbosch University), the Tygerberg Child and Adolescent Psychiatry Unit (linked to Stellenbosch University), and the Division of Child and Adolescent Psychiatry at Red Cross War Memorial Children's Hospital (linked to the University of Cape Town). As a point of reference, service availability and provision in the Western Cape for CAMH should form the basis from which services are developed across the other provinces.

The analysis did try to identify different sources of financing for the required investments but may not have comprehensively identified all available sources, particularly across other sectors. The country will need to assess the extent to which domestic financing availability is sufficient for the scale-up required whilst exploring other mechanisms for development assistance. Some opportunities have been identified in this report.

Finally, the potential for social and emotional learning interventions for children and adolescents to yield economic returns later in the life course could not be estimated. The inclusion of such effects would bolster estimated economic returns significantly.

24.
Recommendations

South Africa faces a substantial treatment gap for mental, neurological and substance-use (MNS) disorders, with inpatient care dominating mental health care expenditure and existing community-based care options inadequate. Service-users are discharged back to their families or poorly equipped NGOs in the community, and due to inadequate support and continuity of care received, frequently relapse and are subsequently re-hospitalized [212]. The inadequate resourcing for community-based mental health care coupled with the inefficiency of spending render the current availability of services, predominantly at the hospital level, unable to address the significant mental health needs in the country.

Recognizing that the most cost-effective interventions incorporate mental health care into primary or community care [213], the country has endorsed an integrated, intersectoral model for community-based mental health services (CMHS) in its national Mental Health Policy Framework of 2013. South Africa operates a decentralised health system with responsibility for policy implementation devolved to the 9 provinces and provision of health services rendered by the District Health System. Similar to other low- and middle-income countries (LMICs); policy making, translation and implementation in politically and administratively decentralized systems can be challenging [214].

In this context, this report concludes with a number of key recommendations:

1. *Intersectoral collaboration is needed, between government departments and with NGOs*. The preparation of provincial operational plans requires intense human and financial resource capacities. Previous work [215, 216] has shown that provincial health departments, the local governments and non-governmental organisations (NGOs) that they work with, have faced key challenges to intersectoral working in South Africa. These include a lack of communication between sectors, challenges delineating roles and having an explicit mandate to work across sectors, limited capacity for joint operational planning and budgeting, a lack of monitoring systems to track activities and each sector's perception of lack of support from sister departments.

   Whilst efforts towards the creation of intersectoral forums have been made at provincial and district levels, a mandate for attendance is lacking and those with decision-making power are often missing from these meetings; this compromises the abilities for such intersectoral forums to be successful. Recommendations emerging from key stakeholders across departments have included improving communication across sectors, promoting leadership from all levels and formalizing intersectoral relationships through written agreements and joint operational planning, sufficient training across all departments on their mandates, and ensuring that resources are redirected appropriately to the implementation level.

2. *Political buy-in is vital, particularly at provincial level including Member(s) of the Executive Council(s). Head(s) of Department(s)*. Political buy-in, supported by provincial capacity for strategic planning and strong intersectoral governance, is a key bottleneck to operationalizing mental health policy and the implementation of community-based mental health services (CMHS). Beyond the provincial acceptance of the MHPF and the CMHS model, adherence to policy implementation processes has been poor. The absence of implementation guidelines and technical support to inform the development of costed and budgeted strategic plans for CMHS in all provinces is a major barrier to the implementation of an integrated, intersectoral CMHS model[217].

3. *Build consensus on key issues*. The process of priority setting and establishing consensus for mental health service delivery is very challenging, particularly when stakeholders are asked to establish priorities beyond their areas of expertise. There remain areas of discordance around the roles of the District Mental Health Teams and the potential need for mental health review boards across all 52

districts. Interventions modelled in this analysis for scale-up aligns well to those achieving consensus through our Delphi exercise. The final inputs of the Delphi exercise are summarized below.

4. *Invest in governance structures at provincial and district level*. The lack of comprehensive mental health directorates across provinces serves as a significant impediment to appropriate planning and implementation at the local level. Current staff operating at these levels are overstretched, and the increasing pressure to implement the recommendations of the human rights commission requires sufficient personnel in place. Provincial engagements and comprehensive stakeholder engagements was critical to embed the modelled interventions within the realities faced on the ground in the country.

5. *Build capacity for planning and mental health system strengthening*. Evidence-based capacity-building has emerged as critical to mental health system strengthening in LMICs[218] and previous efforts in our context have demonstrated that building capacity in mental health system strengthening among policy-makers is both feasible and welcomed in our context[219]. Capacity for strategic planning for mental health at the provincial level is critical for population-based improvements in health outcomes. This includes all systematic planning, programming, and budgeting processes; these actions may translate into improved accountability of public policy to the recipients of services, help increase community participation, improve the flexibility in planning, and help mitigate geographical and social imbalances.

6. *Invest in research and information systems for mental health*. South Africa must urgently prioritize a national prevalence study to estimate the current burden of MNS disorders in the country. Furthermore, indicators to track mental health service delivery will need to be strengthened to allow for appropriate tracking of patient care and referral pathways, disorder specific treatment provision and outcomes to appropriately manage the scale-up of services.

7. *Improve efficiency*. This report provides a framework for improved efficiencies, not least through shifting resources over time to increased primary care and community-based services. The country's commitment towards strengthened primary health care services does provide an opportunity to improve the technical efficiency of investments for mental health service delivery; although the lack of sufficient considerations of mental health services within such efforts remains an impediment.

8. *Invest in primary care and community-based mental health services*. Mental healthcare can be successfully integrated within PHC clinics through the provision of interventions that promote task-sharing of

basic counselling and referral. Through investments towards strengthening the primary health care level, clinics will increasingly play the role of patient triaging, including upward referals for increasingly complex cases as well as care for cases stepped down from hospital settings. Ward-based primary healthcare outreach teams (WBOTs) linked to these facilities can then undertake household visits where they can conduct mental health education to improve mental health literacy in households, and identify possible cases requiring further management. The provision of household outreach services is also undertaken by the Department of Social Development (DoSD) and non-profit social workers; increased collaboration with these networks will be essential. Decentralisation of mental health services towards increased primary health care provision must be accompanied with significant scale-up in training capacity, whilst ensuring that adequate supervision is provided. Provinces have noted that with sufficient training and support, generalist health workers are willing and able to provide mental health services. There remains a key opportunity to leverage opportunities to provide integrated care given the high level of comorbidities that exist between mental health conditions and other chronic and infectious diseases imposing a significant burden on the health system. Such approaches would translate into improved efficiency in service delivery.

9. *Invest in human resources for mental health*. The absolute shortages of key personnel, inappropriate skills mixes, as well as the inequitable distribution of resources across health levels, geographical and economic lines, coupled with severe public-to-private drainage, barriers to inter-professional collaboration, and the inefficient use of resources, all persist. This highlights the immediate need for a rational and comprehensive response which promotes increased co-ordination between all levels of the health sector and a focus on an incremental optimization of human resources to deliver critical mental health services in South Africa.

10. *Invest in infrastructure for successful scale-up*. Globally published guidance on the undertaking of economic evaluations and returns on investment analysis are simplistic in their approach to modeling the potential implications of rolling out new interventions and technologies on account of their neglect of the necessary investments required in delivery platforms to effect change. This is particularly relevant as it relates to mental health service scale-up in South Africa, in which strategies required to navigate away from hospi-centric and narrow services for mental health are currently nascent. There is a well-established literature reflecting on the impact of physical health system constraints on the optimal range of interventions that may be provided [220].

    Current health system resource constraints in the areas of sufficient governance for planning and implementation, health information

systems to monitor implementation, comprehensive training, and capital infrastructure investments limit the capacity to produce measured outcomes of globally recommended cost-effective interventions for mental health. Cost-effectiveness studies that both consider costs of roll-out at scale, along with all their service delivery, human resources, health information, and financing ramifications, remain limited. As such, many evidence-based interventions that are identified to be "cost-effective," are incorrectly qualified as "inexpensive" or "efficient." In global health, effectiveness is used as the main criterion for supporting introduction of new health services, with less attention paid to costs, affordability, or long-term sustainability. This results in many programs being evaluated on the number of outputs that can be produced or their predicted outcomes, without sufficient consideration of the resources required to produce them and the financial feasibility and sustainability at scale of such decisions.

The inclusion of the wide range of health system and programmatic investments as key interventions to accompany service reccomendations are therefore key. The inclusion of these broader investments in this analysis aims to support government and their departments to identify and measure the required resources to implement the proposed interventions and enhance the health system's capacity to deliver services. When resources are properly valued and allocated, a more a more accurate reflection of the costs and potential returns on investments is assured.

11. *Embrace technology and innovative service delivery models*. Countries are moving towards making their mental health systems more innovative and future-focused using new approaches to mental health support such as apps and telemedicine. Such opportunities should be explored and leveraged in our context, but it is also essential to have a sustainable workforce and a strong data infrastructure to track and improve performance.

12. *Pay attention to vulnerable populations and neglected conditions, particularly among older adults*. Importantly, there were some interventions modelled in our investment case that did not yield positive returns on investment, and those, by consensus through the Delphi were also not prioritized for scale-up. This is likely also due to the dearth of evidence demonstrating positive impacts for our setting. Such interventions include screening and pharmacological management of dementia, family psycho-education conduct disorder and ADHD, as well as methylphenidate medication for ADHD, and the management of opioid and non-opioid withdrawal. Interventions to support care-givers of people living with dementia did emerge as a recommendation from the group, and the provision of day and residential services modelled in our analysis could provide one way to do so. The changing population structure of South Africa has revealed

that the over 60 population is growing at a rate of 2.7% each year, nearly twice the rate for the population under 60 (1.4) Those over the age of 60 are overall nearly five times more likely to develop a chronic condition [221]. It has been estimated that by 2050, 131.5 million people are expected to develop dementia, of whom nearly 70% will be from LMICs [222]. Costs of dementia care have been seen to increase significantly between 2010 and 2015, and whilst the majority of these costs are borne by high income countries, projected costs for upper middle income countries have seen an increase of 165% from USD 5.4 billion in 2010 to USD 86.3 billion in 2015 [223]. Investment in dementia care is therefore vital in the medium and long-term.

13. *Investments must target the considerable gap in service availability for child and adolescent mental health services whilst addressing their social and emotional wellbeing at a population-level*. It is well known, and has been reiterated through provincial engagement, that the lack of child- and adolescent-friendly services within the health care setting represents a significant impediment to accessing this population; this will need to be urgently addressed to make strides in improving the health and well-being of children and adolescents – and the future wellbeing of South Africans. Whilst this Investment Case has demonstrated that the provision of universal social and emotional programmes to all learners represents a promising, and high-yield opportunity for addressing the social and emotional wellbeing of this population; accessibility of treatment for children and adolescents already living with diagnosable mental health disorders must be strengthened and supplemented with parental involvement.

14. *The role of the private sector in the mental health scale-up response must be leveraged as a critical opportunity for NHI public-private partnerships and pilot initiatives*. The Global COVID response has demonstrated that successfully containing the pandemic can only be achieved through a coordinated and integrated response that draws on the resources across both public and private health sectors working towards a unified national interest. Such coordination in South Africa is vital to draw on the vast resources of the private sector, with efforts being ignited on account of the pandemic. These lessons can be applied moving forward with regards to scaling up the country's mental health response, a priority that has emerged across the public and private sectors alike.

PART F

REFERENCES

1. WHO. Principles of health benefit packages. Geneva: 2021.
2. Moseneke D. Award in the arbitration between families of mental health care users affected by the Gauteng Mental Marathon Project and the National Minister of Health of the Republic of South Africa, Government of the Province of Gauteng, Premier of the Province of Gauteng, and Member of the Executive Council for Health of the Province of Gauteng. Johannesburg; 2018.
3. South African Human Rights Commission. Report of the National Investigative Hearing into the Status of Menta Health Care in South Africa 2017.
4. Makgoba MW. The Life Esidimeni disaster: The Makgoba report. Health Ombudsman: Republic of South Africa, 2017.
5. Republic of South Africa. Mental Health Care Act No. 17 of 2002. Government Gazette. 2002;49(24024):1-78.
6. Docrat S, Lund C, Chisholm D. Sustainable financing options for mental health care in South Africa: findings from a situation analysis and key informant interviews. International journal of mental health systems. 2019;13(1):4.
7. South Africa Department of Health, South African National AIDS Council. South African HIV and TB Investment Case-Summary Report Phase 1. 2016.
8. AIDSinfo [Internet]. 2018 [cited July 2021]. Available from: http://aidsinfo.unaids.org/.
9. Avert. HIV and AIDS in South Africa 2015 [updated 2015-07-21]. Available from: https://www.avert.org/professionals/hiv-around-world/sub-saharan-africa/south-africa.
10. Docrat S, Besada D, Lund C. AN EVALUATION OF THE HEALTH SYSTEM COSTS OF MENTAL HEALTH SERVICES AND PROGRAMMES IN SOUTH AFRICA. 2019.
11. Docrat S, Besada D, Cleary S, Daviaud E, Lund C. Mental health system costs, resources and constraints in South Africa: a national survey. Health Policy and Planning. 2019;34(9):706-19. doi: 10.1093/heapol/czz085 %J Health Policy and Planning.
12. White R, Charalambous S, Cardenas V, Hippner P, Sumner T, Bozzani F, et al. Evidence-informed policy making at country level: lessons learned from the South African Tuberculosis Think Tank. The International Journal of Tuberculosis and Lung Disease. 2018;22(6):606-13.
13. National Health Insurance Bill, (2019).
14. Docrat S, Besada D, Cleary S, Daviaud E, Lund C. Mental health system costs, resources and constraints in South Africa: a national survey. Health Policy and Planning. 2019. doi: https://doi:10.1093/heapol/czz085.
15. Stein DJ, Seedat S, Herman A, Moomal H, Heeringa SG, Kessler RC, et al. Lifetime prevalence of psychiatric disorders in South Africa. British Journal of Psychiatry. 2008;192:112-7.
16. Prince M, Patel V, Saxena S, Maj M, Maselko J, Phillips MR, et al. No health without mental health. Lancet. 2007;370:859-77.
17. Petersen I, Bhana A, Fairall L, Selohilwe O, Kathree T, Garman E, et al. Evaluation of a collaborative care model for integrated primary care of common mental disorders comorbid with chronic conditions in South Africa. BMC psychiatry. 2019;19(107). doi: https://doi.org/10.1186/s12888-019-2081-z.
18. Patel V, Saxena S, Lund C, Thornicroft G, Baingana F, Bolton P, et al. The Lancet Commission on global mental health and sustainable development. Lancet. 2018. Epub 2018/10/14. doi: 10.1016/S0140-6736(18)31612-X. PubMed PMID: 30314863.

19. Lund C, Brooke-Sumner C, Baingana F, Baron EC, Breuer E, Chandra P, et al. Social determinants of mental disorders and the Sustainable Development Goals: a systematic review of reviews. The lancet Psychiatry. 2018;5(4):357-69. Epub 2018/03/28. doi: 10.1016/s2215-0366(18)30060-9. PubMed PMID: 29580610.
20. Lund C, Myer L, Stein D, Williams D, Flisher A. Mental illness and lost income among adult South Africans. Soc Psychiatry Psychiatr Epidemiol. 2013;48. doi: 10.1007/s00127-012-0587-5.
21. Kola L, Kohrt BA, Hanlon C, Naslund JA, Sikander S, Balaji M, et al. COVID-19 mental health impact and responses in low-income and middle-income countries: reimagining global mental health. The lancet Psychiatry. 2021;8(6):535-50. Epub 2021/02/28. doi: 10.1016/S2215-0366(21)00025-0. PubMed PMID: 33639109.
22. Abrahams Z, Boisits S, Schneider M, Prince M, Lund C. Domestic violence, food insecurity and mental health of pregnant women in the COVID-19 lockdown in Cape Town, South Africa. Research Square Pre-print. 2021. doi: https://doi.org/10.21203/rs.3.rs-102205/v1.
23. Merten M. Medium-Term Budget Policy Statement: Tito Mboweni asks for a 'mini budget' delay – a worrying sign the economic line isn't holding. Daily Maverick. 2020.
24. Ranchod V BI, Budlender J, et al. 2. 2020. . Employment. An overview of results from the NIDSCRAM Wave 1 2020.
25. Treasury DoN. South Africa. Supplementary Budget Review. 2020.
26. Department of Health SA. White Paper: National Health Insurance Policy. Towards Universal Coverage. 2017.
27. Solanki GC, Wilkinson T, Daviaud E, Besada D, Tamandjou Tchuem CR, Docrat S, et al. Managing the healthcare demand-supply gap during and after COVID-19: The need to review the approach to healthcare priority-setting in South Africa2020.
28. Fuchs VR. Who Shall Live? Health, Economics And Social Choice (2nd Expanded Edition): World Scientific Publishing Company; 2011.
29. Ashcroft RE. Who should we treat? Rights, rationing and resources in the NHS. J Med Ethics. 2007;33(3):185-6. doi: 10.1136/jme.2006.017004. PubMed PMID: PMC2598253.
30. What's In, What's Out: Designing Benefits for Universal Health Coverage. Center For Global Development.
31. Chalkidou K, Glassman A, Marten R, Vega J, Teerawattananon Y, Tritasavit N, et al. Priority-setting for achieving universal health coverage. Bulletin of the World Health Organization. 2016;94(6):462-7. Epub 2016/06/09. doi: 10.2471/blt.15.155721. PubMed PMID: 27274598; PubMed Central PMCID: PMCPMC4890204.
32. Chalkidou K, Tucker J-M, Pillay YJSAHR. Establishing the NHI Service Benefits Framework: lessons learnt and stakeholder engagement. 2019;2019(1):43-53.
33. Wagstaff A, Cotlear D, Eozenou PH-V, Buisman LR. Measuring progress towards universal health coverage: with an application to 24 developing countries. Oxford Review of Economic Policy. 2016;32(1):147-89. doi: 10.1093/oxrep/grv019 %J Oxford Review of Economic Policy.
34. Lancet Global Mental Health Group. Scale up services for mental disorders: a call for action. Lancet. 2007;370:1241-52.
35. WHO. Mental Health Gap Action Programme: scaling up care for mental, neurological and substance use disorders. Geneva: WHO; 2008.

36. Chisholm D, Sweeny K, Sheehan P, Rasmussen B, Smit F, Cuijpers P, et al. Scaling up treatment of depression and anxiety: a global return on investment analysis. The lancet Psychiatry. 2016;http://dx.doi.org/10.1016/.
37. WHO. Guidance and technical packages on community mental health services. Geneva: WHO; 2021.
38. WHO. Helping Adolescents Thrive Toolkit. Geneva: WHO; 2021.
39. Myers B, Lund C, Lombard C, Joska J, Levitt N, Butler C, et al. Comparing dedicated and designated models of integrating mental health into chronic disease care: study protocol for a cluster randomized controlled trial. Trials. 2018;19(1):185. Epub 2018/03/20. doi: 10.1186/s13063-018-2568-9. PubMed PMID: 29548302; PubMed Central PMCID: PMCPMC5857135.
40. Boisits S, Abrahams Z, Schneider M, Honikman S, Kaminer D, Lund C. Developing a task-sharing psychological intervention to treat mild to moderate symptoms of perinatal depression and anxiety in South Africa: a mixed-method formative study. Int J Ment Health Syst. 2021;15(1):23. Epub 2021/03/17. doi: 10.1186/s13033-021-00443-5. PubMed PMID: 33722252; PubMed Central PMCID: PMCPMC7958439.
41. Patel V, Chisholm D, Dua T, Laxminarayan R, Medina-Mora MaL. Disease Control Priorities, (Volume 4): Mental, Neurological, and Substance Use Disorders: The World Bank; 2016.
42. Patel V, Saxena S, Lund C, Thornicroft G, Baingana F, Bolton P, et al. The Lancet Commission on global mental health and sustainable development. The Lancet. 2018;392(10157):1553-98.
43. American Psychiatric Association. Diagnostic and statistical manual of mental disorders (DSM-5®): American Psychiatric Pub; 2013.
44. WHO. ICD-11 for mortality and morbidity statistics. Retrieved June. 2018;22:2018.
45. WHO. Mental Disorders: World Health Organization; 2018 [updated 9 April 2018; cited 2019 19 October]. Available from: https://www.who.int/news-room/fact-sheets/detail/mental-disorders.
46. Patel V, Minas H, Cohen A, Prince MJ. Global mental health: principles and practice: Oxford University Press; 2013.
47. World Health Organization, UNDP. Making the investment case for mental health: a WHO / UNDP Methodological Guidance Note. World Health Organization, 2019.
48. Avenir Health. Avenir Health Online2012 [cited 2016 24 November 2016]. Available from: http://www.avenirhealth.org/.
49. World Health Organization, United Nations Development Programme. Mental health investment case: a guidance note. 2021.
50. Organization WH. mhGAP Intervention Guide - Version 2.0 for mental, neurological and substance use disorders in non-specialized health settings. WHO, 2016.
51. Patel V, D. Chisholm., T. Dua, R. Laxminarayan, and M. E. Medina-Mora. Mental, Neurological, and Substance Use Disorders. Disease Control Priorities. Washington World Bank 2015.
52. Organization WH. Global status report on alcohol and health 2018: World Health Organization; 2019.
53. Pengpid S, Peltzer K, Ramlagan S. Prevalence and correlates of hazardous, harmful or dependent alcohol use and drug use amongst persons 15 years and older in South Africa: Results of a national survey in 2017. African journal of primary health care & family medicine. 2021;13(1):1-8.
54. Stenberg K, Axelson H, Sheehan P, Anderson I, Gülmezoglu AM, Temmerman M, et al. Advancing social and economic development by investing in women's and

children's health: a new Global Investment Framework. Lancet. 2014;383(9925):1333-54. Epub 2013/11/23. doi: 10.1016/s0140-6736(13)62231-x. PubMed PMID: 24263249.
55. Jamison DT, Summers LH, Alleyne G, Arrow KJ, Berkley S, Binagwaho A, et al. Global health 2035: a world converging within a generation. Lancet. 2013;382(9908):1898-955. Epub 2013/12/07. doi: 10.1016/s0140-6736(13)62105-4. PubMed PMID: 24309475.
56. Mall S, Lund C, Vilagut G, Alonso J, Williams DR, Stein DJ. Days out of role due to mental and physical illness in the South African stress and health study. Social psychiatry and psychiatric epidemiology. 2015;50(3):461-8. Epub 2014/08/07. doi: 10.1007/s00127-014-0941-x. PubMed PMID: 25096982; PubMed Central PMCID: PMCPMC4322217.
57. Alonso J, Petukhova M, Vilagut G, Chatterji S, Heeringa S, Üstün TB, et al. Days out of role due to common physical and mental conditions: results from the WHO World Mental Health surveys. Molecular Psychiatry. 2011;16(12):1234-46. doi: 10.1038/mp.2010.101.
58. STATS SA. Mid-year population Estimates 2020. Available from: http://www.statssa.gov.za/publications/P0302/P03022020.pdf.
59. Labor force, total - South Africa derived using data from International Labour Organization, ILOSTAT database. [Internet]. World Bank. 2020. Available from: https://data.worldbank.org/indicator/SL.TLF.TOTL.IN?locations=ZA.
60. Jamison DT, Summers LH, Alleyne G, Arrow KJ, Berkley S, Binagwaho A, et al. Global health 2035: a world converging within a generation. The Lancet. 2013;382(9908):1898-955. doi: 10.1016/s0140-6736(13)62105-4.
61. Chisholm D, Sweeny K, Sheehan P, Rasmussen B, Smit F, Cuijpers P, et al. Scaling-up treatment of depression and anxiety: a global return on investment analysis. The lancet Psychiatry. 2016;3(5):415-24. Epub 2016/04/17. doi: 10.1016/s2215-0366(16)30024-4. PubMed PMID: 27083119.
62. Docrat S, Besada D, Cleary S, Daviaud E, Lund C. Mental health system costs, resources and constraints in South Africa: a national survey. Health Policy and Planning. 2019;(Advance). doi: 10.1093/heapol/czz085.
63. Massyn N, Padarath A, Peer N, Day C. District Health Barometer 2016/17. Health Systems Trust. 2017.
64. Massyn N DC, Ndlovu N, Padayachee T, editors. . District Health Barometer 2019/20. . Durban Health Systems Trust, 2020.
65. Bruckner TA, Scheffler RM, Shen G, Yoon J, Chisholm D, Morris J, et al. The mental health workforce gap in low-and middle-income countries: a needs-based approach. 2011;89:184-94.
66. Patel V, Chisholm D, Dua T, Laxminarayan R, Vos T. Disease control priorities, (Volume 4): Mental, Neurological, and Substance Use Disorders: World Bank Publications; 2016.
67. Skeen S, Laurenzi CA, Gordon SL, du Toit S, Tomlinson M, Dua T, et al. Adolescent mental health program components and behavior risk reduction: a meta-analysis. 2019;144(2).
68. South Africa National Treasury. Budget Review. South Africa National Treasury,, 2018.
69. Institute for Health M, Evaluation. Global Burden of Disease Study 2019. 2019.
70. World Health Organization. Global status report on alcohol and health 2018: World Health Organization; 2019.

71. Mckenzie JA, McConkey R, Adnams CM. Health conditions and support needs of persons living in residential facilities for adults with intellectual disability in Western Cape Province2013.
72. Naimoli JF, Saxena S, Hatt LE, Yarrow KM, White TM, Ifafore-Calfee TJHP, et al. Health system strengthening: prospects and threats for its sustainability on the global health policy agenda. 2018;33(1):85-98.
73. Eisman AB, Kilbourne AM, Dopp AR, Saldana L, Eisenberg D. Economic evaluation in implementation science: Making the business case for implementation strategies. Psychiatry research. 2020;283:112433. doi: https://doi.org/10.1016/j.psychres.2019.06.008.
74. Sohn H, Tucker A, Ferguson O, Gomes I, Dowdy D. Costing the implementation of public health interventions in resource-limited settings: a conceptual framework. Implementation Science. 2020;15(1):86. doi: 10.1186/s13012-020-01047-2.
75. National Department of Health. National Mental Health Policy Framework and Strategic Plan 2013-2020. Pretoria: NDoH, 2012.
76. Amini DA, Kannenberg K, Bodison S, Chang P, Colaianni D, Goodrich B, et al. Occupational therapy practice framework: Domain & process 3rd edition. 2014;68(Supplement 1):S1-S48.
77. American Occupational Therapy Association %J Bethesda M. Occupational therapy's distinct value: Mental health promotion, prevention, and intervention across the lifespan. 2016.
78. O'Donnell H. The path forward: Investing in the Illinois community mental health system [policy brief]. Chicago: Thresholds, 2013.
79. Clark F, Jackson J, Carlson M, Chou C-P, Cherry BJ, Jordan-Marsh M, et al. Effectiveness of a lifestyle intervention in promoting the well-being of independently living older people: results of the Well Elderly 2 Randomised Controlled Trial. 2012;66(9):782-90.
80. Hay J, LaBree L, Luo R, Clark F, Carlson M, Mandel D, et al. Cost-effectiveness of preventive occupational therapy for independent-living older adults. 2002;50(8):1381-8.
81. Western Cape Government. Malmesbury Community Day Centre Officially Opened 2013. Available from: https://www.westerncape.gov.za/news/malmesbury-community-day-centre-officially-opened.
82. South African College of Applied Psychology. Why a BPsych Degree is a better option 2019 [updated 2019]. Available from: https://www.sacap.edu.za/blog/management-leadership/bpsych-degree/.
83. Anderson L. Knowledge Translation Unit.
84. National Department of Health. Department of Health Knowledge Hub.
85. Petersen I. Centre for Rural Health, University of KwaZulu-Natal.
86. Sibeko G. South Africa HIV Addiction Technology Transfer Center (ATTC) Network.
87. South Africa ITTC. Screening, Brief Intervention, Referral to Treatment Training of Trainers Model 2019 [updated 2019/11//]. Available from: https://ittcnetwork.org/ITTC/resourceDetails.aspx?resourceID=119.
88. Honikman S. Perinatal Mental Health Project.
89. Scott K, Sibeko G, Cummings B, Myers B, Sorsdahl K, Stein DJ, et al. Training the addiction treatment workforce in HIV endemic regions: An overview of the South Africa HIV Addiction Technology Transfer Center initiative. 2020;14(1):78.

90. Petersen I, Bhana A, Fairall LR, Selohilwe O, Kathree T, Baron EC, et al. Evaluation of a collaborative care model for integrated primary care of common mental disorders comorbid with chronic conditions in South Africa. 2019;19(1):1-11.
91. Stassen W, Wallis L, Vincent-Lambert C, Castren M, Kurland L. The proportion of South Africans living within 60 and 120 minutes of a percutaneous coronary intervention facility. Cardiovascular journal of Africa. 2018;29(1):6-11. doi: 10.5830/CVJA-2018-004. PubMed PMID: 29582877.
92. Trading Economics. South Africa - Rural Population - 1960-2020 2021 [updated 2021/07//]. Available from: https://tradingeconomics.com/south-africa/rural-population-percent-of-total-population-wb-data.html.
93. Fund WHOatUNCs. Helping adolescents thrive toolkit: strategies to promote and protect adolescent mental health and reduce self-harm and other risk behaviours. Geneva: WHO & UNICEF, 2021.
94. Wasserman D, Carli V, Wasserman C, Apter A, Balazs J, Bobes J, et al. Saving and Empowering Young Lives in Europe (SEYLE): a randomized controlled trial. BMC Public Health. 2010;10(1):192. doi: 10.1186/1471-2458-10-192.
95. Devenish B, Berk L, Lewis AJ. The treatment of suicidality in adolescents by psychosocial interventions for depression: A systematic literature review. The Australian and New Zealand journal of psychiatry. 2016;50(8):726-40. Epub 2016/02/21. doi: 10.1177/0004867415627374. PubMed PMID: 26896044.
96. Robinson J, Bailey E, Witt K, Stefanac N, Milner A, Currier D, et al. What Works in Youth Suicide Prevention? A Systematic Review and Meta-Analysis. EClinicalMedicine. 2018;4-5:52-91. Epub 2019/06/14. doi: 10.1016/j.eclinm.2018.10.004. PubMed PMID: 31193651; PubMed Central PMCID: PMCPMC6537558.
97. Robinson J, Calear AL, Bailey E. Suicide prevention in educational settings: a review. Australasian psychiatry : bulletin of Royal Australian and New Zealand College of Psychiatrists. 2018;26(2):132-40. Epub 2018/03/16. doi: 10.1177/1039856218759406. PubMed PMID: 29542332.
98. Question to the Minister in the Presidency - NW57 | PMG.
99. Solanki GC, Wilkinson T, Daviaud E, Besada D, Tamandjou Tchuem CR, Docrat S, et al. Managing the healthcare demand-supply gap during and after COVID-19: The need to review the approach to healthcare priority-setting in South Africa %J SAMJ: South African Medical Journal. 2021;111:20-2.
100. Chisholm D, Saxena S, Van Ommeren M. Dollars, DALYs and decisions: economic aspects of the mental health system: World Health Organization; 2006.
101. Jorm AF. Using the Delphi expert consensus method in mental health research. The Australian and New Zealand journal of psychiatry. 2015;49(10):887-97. Epub 2015/08/25. doi: 10.1177/0004867415600891. PubMed PMID: 26296368.
102. Reporter W. 'Mental health is the biggest threat in 2021' - SA Society of Psychiatrists. Witness.
103. Kim AW, Nyengerai T, Mendenhall E. Evaluating the Mental Health Impacts of the COVID-19 Pandemic in Urban South Africa: Perceived Risk of COVID-19 Infection and Childhood Trauma Predict Adult Depressive Symptoms. 2020:2020.06.13.20130120. doi: 10.1101/2020.06.13.20130120 %J medRxiv.
104. Naidu T. The COVID-19 pandemic in South Africa. Psychological Trauma: Theory, Research, Practice, and Policy. 2020;12(5):559-61. doi: 10.1037/tra0000812.
105. (2020). HSRC. HSRC responds to the COVID-19 outbreak. 2020.

106. Nguse S, Wassenaar D. Mental health and COVID-19 in South Africa. South African Journal of Psychology. 2021;51(2):304-13. doi: 10.1177/00812463211001543.
107. Ornell F, Schuch JB, Sordi AO, Kessler FHPJBJoP. "Pandemic fear" and COVID-19: mental health burden and strategies. 2020;42(3):232-5.
108. OECD EaDRCot. OECD Economic Surveys South Africa July 2020.
109. Patel V, Saxena S, Lund C, Thornicroft G, Baingana F, Bolton P, et al. The Lancet Commission on Global Mental Health and Sustainable Development. The Lancet. 2018;392(10157):1553-98. doi: 10.1016/S0140-6736(18)31612-X.
110. Thornicroft G, Patel V. Including mental health among the new sustainable development goals. Bmj. 2014;349:g5189. Epub 2014/08/26. doi: 10.1136/bmj.g5189. PubMed PMID: 25145688.
111. Thornicroft G, Patel V. Including mental health among the new sustainable development goals. BMJ : British Medical Journal. 2014;349:g5189. doi: 10.1136/bmj.g5189.
112. JK. B. The mental health gap in South Africa – a human rights issue. The Equal Rights Review. 2011.
113. OECD. A New Benchmark for Mental Health Systems2021.
114. Mintrom M. New Zealand's Wellbeing Budget Invests in Population Health. The Milbank Quarterly. 2019;97(4):893-6.
115. Robertson LJ CB, van Rensburgi ABJ, Talatala M. Towards universal health coverage for people living with mental illness in South Africa. South African Health Review 2018: Health Systems Trust; 2018.
116. Docrat SB, D. Lund, C. . An Evaluation of the Health System Costs of Mental Health Services and Programmes in South Africa. 2016/17 Financial Year. Cape Town: University of Cape Town, South African Medical Research Council, 2018.
117. Novella EJ. Theoretical accounts on deinstitutionalization and the reform of mental health services: a critical review. Medicine, health care, and philosophy. 2008;11(3):303-14. Epub 2008/02/14. doi: 10.1007/s11019-008-9123-5. PubMed PMID: 18270804.
118. Novella EJ. Mental health care in the aftermath of deinstitutionalization: a retrospective and prospective view. Health Care Anal. 2010;18(3):222-38. Epub 2010/01/12. doi: 10.1007/s10728-009-0138-8. PubMed PMID: 20063200.
119. Leff J, Trieman N. Long-stay patients discharged from psychiatric hospitals - Social and clinical outcomes after five years in the community. The TAPS Project 46. The British journal of psychiatry : the journal of mental science. 2000;176:217-23. doi: 10.1192/bjp.176.3.217.
120. Marwaha S, Johnson S, Bebbington P, Angermeyer MC, Brugha T, Azorin JM, et al. Correlates of subjective quality of life in people with schizophrenia: findings from the EuroSC study. The Journal of nervous and mental disease. 2008;196(2):87-94. Epub 2008/02/16. doi: 10.1097/NMD.0b013e318162aa9c. PubMed PMID: 18277215.
121. Raghavan R. The role of economic evaluation in dissemination and implementation research. Dissemination and implementation research in health: Translating science to practice. 2012;2:89-106.
122. Barry MM, Clarke AM, Jenkins R, Patel V. A systematic review of the effectiveness of mental health promotion interventions for young people in low and middle income countries. BMC Public Health. 2013;13(1):835. doi: 10.1186/1471-2458-13-835.
123. Ginsburg GS, Kendall PC, Sakolsky D, Compton SN, Piacentini J, Albano AM, et al. Remission after acute treatment in children and adolescents with anxiety disorders:

findings from the CAMS. J Consult Clin Psychol. 2011;79(6):806-13. doi: 10.1037/a0025933. PubMed PMID: 22122292.
124. Bazyk S, Bazyk JJAJoOT. Meaning of occupation-based groups for low-income urban youths attending after-school care. 2009;63(1):69-80.
125. Case-Smith J, O'Brien JC. Occupational therapy for children and adolescents-e-book: Elsevier Health Sciences; 2014.
126. Campion J, Taylor MJ, McDaid D, Park A, Shiers DJEliP. Applying economic models to estimate local economic benefits of improved coverage of early intervention for psychosis. 2019;13:1424 - 30.
127. Wakefield MA, Loken B, Hornik RC. Use of mass media campaigns to change health behaviour. Lancet (London, England). 2010;376(9748):1261-71. doi: 10.1016/S0140-6736(10)60809-4. PubMed PMID: 20933263.
128. Egbe CO, Brooke-Sumner C, Kathree T, Selohilwe O, Thornicroft G, Petersen I. Psychiatric stigma and discrimination in South Africa: perspectives from key stakeholders. BMC Psychiatry. 2014;14(1):191. doi: 10.1186/1471-244X-14-191.
129. Marino MI, Adogba O, Tilli N. Mental Health Interventions: Reflections on a Radio Program as Alternative for Stigma Reduction and Social Integration. 2020;5(87). doi: 10.3389/fcomm.2020.550912.
130. Toit M D LL, Keukelaere A, Reagon G, Paremoer L, Rizvi Z, Lake L, Heap M. HEALTH RIGHTS, ISSUES AND RECOMMENDATIONS: Joint Submission of Health Stakeholders in South Africa to the United Nations Committee on Economic, Social and Cultural Rights, 64th Session. People's Health Movement 2018.
131. Ardila-Gómez S, Agrest M, Fernández MA, Rosales M, López L, Díaz ARV, et al. The mental health users' movement in Argentina from the perspective of Latin American Collective Health. Global public health. 2019;14(6-7):1008-19. Epub 2018/09/01. doi: 10.1080/17441692.2018.1514063. PubMed PMID: 30169994; PubMed Central PMCID: PMCPMC6465165.
132. WHO. Global status report on alcohol and health 2018. Geneva: World Health Organization, 2018.
133. Chothia A. Lockdown: 87000 cases of gender based violence reported. The South African 2020.
134. Gerber J. Booze sales ban could save SA R1.3bn, enable treatment of up to 18 000 Covid-19 patients - Parliament hears. News24.
135. van der Westhuizen C, Myers B, Malan M, Naledi T, Roelofse M, Stein DJ, et al. Implementation of a screening, brief intervention and referral to treatment programme for risky substance use in South African emergency centres: A mixed methods evaluation study. PloS one. 2019;14(11):e0224951-e. doi: 10.1371/journal.pone.0224951. PubMed PMID: 31730623.
136. Parry CDJAJoP. A review of policy-relevant strategies and interventions to address the burden of alcohol on individuals and society in South Africa. 2005;8(1):20-4.
137. Kuo CC, Sibeko G, Akande M, Allie S, Tisaker N, Stein DJ, et al. Advancing a cascading train-the-trainer model of frontline HIV service providers in South Africa: protocol of an implementation trial. Addiction Science & Clinical Practice. 2021;16(1):27. doi: 10.1186/s13722-021-00236-8.
138. Boosting Africa's recovery by investing in mental health [Internet]. African Business; 2020. Available from: https://african.business/2020/11/technology-information/super-charging-the-african-economic-recovery-from-covid-19-investing-in-mental-health/

139. Deloitte. The ROI in workplace mental health programs: Good for people, good for business. A blueprint for workplace mental health programmes.
140. Hampson E, Soneji U, Jacob A, Mecu B, McGahan H. Mental health and employers: the case for investment: supporting study for the Independent Review. London: Deloitte, 2017.
141. Africa SS. Available from: http://www.statssa.gov.za/?p=13765.
142. Coast J, Smith R, Lorgelly P. Should the capability approach be applied in health economics? : Wiley Online Library; 2008.
143. Mitra S. The Capability Approach and Disability. Journal of Disability Policy Studies. 2006;16(4):236-47. doi: 10.1177/10442073060160040501.
144. Sen A. Development as Freedom. Oxford: Oxford University Press; 1999.
145. Hopper K. Rethinking social recovery in schizophrenia: what a capabilities approach might offer. Soc Sci Med. 2007;65(5):868-79. Epub 05/17. doi: 10.1016/j.socscimed.2007.04.012. PubMed PMID: 17499900.
146. Jenkins R, Baingana F, Ahmad R, McDaid D, Atun R. Social, economic, human rights and political challenges to global mental health. Mental health in family medicine. 2011;8(2):87-96. Epub 2012/06/02. PubMed PMID: 22654971; PubMed Central PMCID: PMCPmc3178190.
147. Botha UA, Koen L, Galal U, Jordaan E, Niehaus DJ. The rise of assertive community interventions in South Africa: a randomized control trial assessing the impact of a modified assertive intervention on readmission rates; a three year follow-up. BMC psychiatry. 2014;14:56. Epub 2014/02/28. doi: 10.1186/1471-244x-14-56. PubMed PMID: 24571621; PubMed Central PMCID: PMCPMC3974055.
148. Engelbrecht R, Plastow N, Botha U, Niehaus D, Koen L. The effect of an occupational therapy mental health day treatment centre on the use of inpatient services in the Western Cape, South Africa. Disability and Rehabilitation. 2019;41(16):1974-80. doi: 10.1080/09638288.2018.1453873.
149. Tretteteig S, Vatne S, Rokstad AM. The influence of day care centres for people with dementia on family caregivers: An integrative review of the literature. Aging & mental health. 2015;20:1-13. doi: 10.1080/13607863.2015.1023765.
150. Sukeri K, A. Betancourt O, Emsley R, Nagdee M, Erlacher H. Forensic mental health services: Current service provision and planning for a prison mental health service in the Eastern Cape. 2016. 2016;22(1). Epub 2016-03-22. doi: 10.4102/sajpsychiatry.v22i1.787.
151. Houidi A, Paruk S, Sartorius B. Forensic psychiatric assessment process and outcome in state patients in KwaZulu-Natal, South Africa %J South African Journal of Psychiatry. 2018;24:1-6.
152. Steyn K, Gaziano TA, Bradshaw D, Laubscher R, Fourie JJJoh. Hypertension in South African adults: results from the Demographic and Health Survey, 1998. 2001;19(10):1717-25.
153. Maredza M, Hofman KJ, Tollman TJSH. A hidden menace: Cardiovascular disease in South Africa and the costs of an inadequate policy response: Health policy and cardiovascular disease. 2011;8(1):48-57.
154. Mash B, Fairall L, Adejayan O, Ikpefan O, Kumari J, Mathee S, et al. A morbidity survey of South African primary care. 2012;7(3):e32358.
155. Oni T, Youngblood E, Boulle A, McGrath N, Wilkinson RJ, Levitt NSJBid. Patterns of HIV, TB, and non-communicable disease multi-morbidity in peri-urban South Africa-a cross sectional study. 2015;15(1):1-8.

156. Endomba FT, Mazou TN, Bigna JJ. Epidemiology of depressive disorders in people living with hypertension in Africa: a systematic review and meta-analysis. BMJ open. 2020;10(12):e037975. doi: 10.1136/bmjopen-2020-037975.
157. Moussavi S, Chatterji S, Verdes E, Tandon A, Patel V, Ustun BJTL. Depression, chronic diseases, and decrements in health: results from the World Health Surveys. 2007;370(9590):851-8.
158. Folb N, Timmerman V, Levitt NS, Steyn K, Bachmann MO, Lund C, et al. Multimorbidity, control and treatment of noncommunicable diseases among primary healthcare attenders in the Western Cape, South Africa. 2015;105(8):642-7.
159. Mendenhall E, Richter LM, Stein A, Norris SAJPO. Psychological and physical co-morbidity among urban South African women. 2013;8(10):e78803.
160. Petersen I, Bhana A, Folb N, Thornicroft G, Zani B, Selohilwe O, et al. Collaborative care for the detection and management of depression among adults with hypertension in South Africa: study protocol for the PRIME-SA randomised controlled trial. Trials. 2018;19(1):192. doi: 10.1186/s13063-018-2518-6.
161. Sin NL, DiMatteo MR. Depression treatment enhances adherence to antiretroviral therapy: a meta-analysis. Ann Behav Med. 2014;47(3):259-69. doi: 10.1007/s12160-013-9559-6. PubMed PMID: 24234601.
162. Blecher MS, Kollipara A, Daven J, Meyer-Rath G, Chiu C, Pillay Y, et al. HIV and AIDS financing in South Africa: sustainability and fiscal space. 2016;2016(1):203-19.
163. Department of Treasury SA. Estimates of National Expenditure 2019.
164. Johnson LF DR. Modelling the impact of HIV in South Africa's provinces: 2021 update. 2021.
165. Peltzer K, Naidoo P, Matseke G, Louw J, McHunu G, Tutshana B. Prevalence of psychological distress and associated factors in tuberculosis patients in public primary care clinics in South Africa. BMC psychiatry. 2012;12:89-. doi: 10.1186/1471-244X-12-89. PubMed PMID: 22839597.
166. Janse Van Rensburg A, Dube A, Curran R, Ambaw F, Murdoch J, Bachmann M, et al. Comorbidities between tuberculosis and common mental disorders: a scoping review of epidemiological patterns and person-centred care interventions from low-to-middle income and BRICS countries. Infectious Diseases of Poverty. 2020;9(1):4. doi: 10.1186/s40249-019-0619-4.
167. Kretchy IA, Owusu-Daaku FT, Danquah SA. Mental health in hypertension: assessing symptoms of anxiety, depression and stress on anti-hypertensive medication adherence. International Journal of Mental Health Systems. 2014;8(1):25. doi: 10.1186/1752-4458-8-25.
168. Rees S, Channon S, Waters CS. The impact of maternal prenatal and postnatal anxiety on children's emotional problems: a systematic review. European child & adolescent psychiatry. 2019;28(2):257-80. Epub 2018/06/15. doi: 10.1007/s00787-018-1173-5. PubMed PMID: 29948234.
169. Wachs TD, Black MM, Engle PL. Maternal Depression: A Global Threat to Children's Health, Development, and Behavior and to Human Rights. 2009;3(1):51-9. doi: https://doi.org/10.1111/j.1750-8606.2008.00077.x.
170. Lindahl V, Pearson JL, Colpe L. Prevalence of suicidality during pregnancy and the postpartum. Archives of Women's Mental Health. 2005;8(2):77-87. doi: 10.1007/s00737-005-0080-1.
171. Dennis CL, Falah-Hassani K, Shiri R. Prevalence of antenatal and postnatal anxiety: systematic review and meta-analysis. The British journal of psychiatry : the journal

of mental science. 2017;210(5):315-23. Epub 2017/03/18. doi: 10.1192/bjp.bp.116.187179. PubMed PMID: 28302701.

172. van Heyningen T, Honikman S, Myer L, Onah MN, Field S, Tomlinson M. Prevalence and predictors of anxiety disorders amongst low-income pregnant women in urban South Africa: a cross-sectional study. Archives of women's mental health. 2017;20(6):765-75. Epub 2017/08/31. doi: 10.1007/s00737-017-0768-z. PubMed PMID: 28852868.

173. Woody CA, Ferrari AJ, Siskind DJ, Whiteford HA, Harris MG. A systematic review and meta-regression of the prevalence and incidence of perinatal depression. Journal of affective disorders. 2017;219:86-92. Epub 2017/05/23. doi: 10.1016/j.jad.2017.05.003. PubMed PMID: 28531848.

174. Cooper PJ, Tomlinson M, Swartz L, Woolgar M, Murray L, Molteno C. Post-partum depression and the mother-infant relationship in a South African peri-urban settlement. The British journal of psychiatry : the journal of mental science. 1999;175:554-8. Epub 2000/05/02. doi: 10.1192/bjp.175.6.554. PubMed PMID: 10789353.

175. Alvarez SL, Meltzer-Brody S, Mandel M, Beeber L. Maternal Depression and Early Intervention: A Call for an Integration of Services. Infants and young children. 2015;28(1):72-87. doi: 10.1097/IYC.0000000000000024. PubMed PMID: 28316368.

176. Rahman A, Fisher J, Bower P, Luchters S, Tran T, Yasamy MT, et al. Interventions for common perinatal mental disorders in women in low- and middle-income countries: a systematic review and meta-analysis. Bull World Health Organ. 2013;91(8):593-601i. Epub 2013/08/14. doi: 10.2471/blt.12.109819. PubMed PMID: 23940407; PubMed Central PMCID: PMCPMC3738304.

177. Forman DR, O'Hara MW, Stuart S, Gorman LL, Larsen KE, Coy KC. Effective treatment for postpartum depression is not sufficient to improve the developing mother-child relationship. Development and psychopathology. 2007;19(2):585-602. Epub 2007/04/27. doi: 10.1017/s0954579407070289. PubMed PMID: 17459185.

178. Rahman A, Malik A, Sikander S, Roberts C, Creed F. Cognitive behaviour therapy-based intervention by community health workers for mothers with depression and their infants in rural Pakistan: a cluster-randomised controlled trial. Lancet. 2008;372(9642):902-9. Epub 2008/09/16. doi: 10.1016/s0140-6736(08)61400-2. PubMed PMID: 18790313; PubMed Central PMCID: PMCPMC2603063.

179. Cooper PJ, Landman M, Tomlinson M, Molteno C, Swartz L, Murray L. Impact of a mother–infant intervention in an indigent peri-urban South African context: Pilot study. British Journal of Psychiatry. 2002;180(1):76-81. Epub 2018/01/02. doi: 10.1192/bjp.180.1.76.

180. Rahman A FJ, Bower P, Luchters S, Tran T, Yasamy MT, Saxena S, Waheed W. I. . Interventions for Common Perinatal Mental Disorders in Women in Low- and Middle-Income Countries: A Systematic Review and Meta-Analysis. Bull World Health Organ. 2013;91(8):593–601.

181. Christodoulou J, Rotheram-Borus MJ, Bradley AK, Tomlinson M. Home Visiting and Antenatal Depression Affect the Quality of Mother and Child Interactions in South Africa. J Am Acad Child Adolesc Psychiatry. 2019;58(12):1165-74. Epub 2019/03/31. doi: 10.1016/j.jaac.2019.03.016. PubMed PMID: 30926571.

182. Honikman S, van Heyningen T, Field S, Baron E, Tomlinson M. Stepped care for maternal mental health: a case study of the perinatal mental health project in South Africa. PLoS Med. 2012;9(5):e1001222. Epub 2012/06/06. doi:

10.1371/journal.pmed.1001222. PubMed PMID: 22666181; PubMed Central PMCID: PMCPMC3362637.
183. Lund C, Schneider M, Garman EC, Davies T, Munodawafa M, Honikman S, et al. Task-sharing of psychological treatment for antenatal depression in Khayelitsha, South Africa: Effects on antenatal and postnatal outcomes in an individual randomised controlled trial. Behaviour research and therapy. 2019:103466. Epub 2019/11/18. doi: 10.1016/j.brat.2019.103466. PubMed PMID: 31733813.
184. Lund C, Schneider M, Davies T, Nyatsanza M, Honikman S, Bhana A, et al. Task sharing of a psychological intervention for maternal depression in Khayelitsha, South Africa: study protocol for a randomized controlled trial. Trials. 2014;15:457. Epub 2014/11/25. doi: 10.1186/1745-6215-15-457. PubMed PMID: 25416557; PubMed Central PMCID: PMCPMC4289378.
185. Callaghan M, Ford N, Schneider H. A systematic review of task- shifting for HIV treatment and care in Africa. Hum Resour Health. 2010;8:8. Epub 2010/04/02. doi: 10.1186/1478-4491-8-8. PubMed PMID: 20356363; PubMed Central PMCID: PMCPMC2873343.
186. Lund C, Schneider M, Garman EC, Davies T, Munodawafa M, Honikman S, et al. Task-sharing of psychological treatment for antenatal depression in Khayelitsha, South Africa: Effects on antenatal and postnatal outcomes in an individual randomised controlled trial. Behaviour research and therapy. 2020;130:103466. doi: https://doi.org/10.1016/j.brat.2019.103466.
187. Treasury N. Budget 2021: Budget Review 2021.
188. Docrat S, Cleary S, Chisholm D, Lund CJPo. The household economic costs associated with depression symptoms: A cross-sectional household study conducted in the North West province of South Africa. 2019;14(11):e0224799.
189. Lund C, Brooke-Sumner C, Baingana F, Baron EC, Breuer E, Chandra P, et al. Social determinants of mental disorders and the Sustainable Development Goals: a systematic review of reviews. 2018;5(4):357-69.
190. Morgan N, Del Fabbro G. Factors associated with recidivism at a South African forensic psychiatric hospital. S Afr J Psychiatr. 2018;24:1125-. doi: 10.4102/sajpsychiatry.v24i0.1125. PubMed PMID: 30263212.
191. McGuire F, Vijayasingham L, Vassall A, Small R, Webb D, Guthrie T, et al. Financing intersectoral action for health: a systematic review of co-financing models. Globalization and health. 2019;15(1):86. doi: 10.1186/s12992-019-0513-7.
192. Early Childhood Development Remains Key Driver for Reducing Inequality in Poor Communities - Parliament of South Africa.
193. Office PB. Policy Brief: Performance on Health Conditional Grants. 2021.
194. WHO. Global Dialogue on Partnerships for Sustainable Financing of NCD Prevention Control. Meeting report. Copenhagen, Denmark: World Health Organization 2019.
195. Feigl B, Bhatt S, Ganjian N, Nelson L, Feigl A, Bhatt S, et al. Outline Business Plan for a Catalytic Multi-Donor Trust Fund for the Prevention and Control of Noncommunicable Diseases and Mental Health Synopsis. 2019.
196. McCarthy K, Goemaere E, Wilkinson L, Tihon V, Vilakazi-Nhlapo K, Hausler H. A practical guide for TB and HIV service integration at primary health care facilities 2011. 2016.
197. Kalonji D, Mahomed OH. Health system challenges affecting HIV and tuberculosis integration at primary healthcare clinics in Durban, South Africa. Afr J Prim Health

Care Fam Med. 2019;11(1):e1-e7. doi: 10.4102/phcfm.v11i1.1831. PubMed PMID: 31170790.
198. Blecher M KA, Mansvelder A, Daven J, Maharaj Y, Gaarekwe O. Health spending at a time of low economic growth and fiscal constraint In: Padarath A BP, editor. South African Health Review 2017. Durban: Health Systems Trust 2017.
199. (NDoH) NDoH. 2030 Human Resources for Health Strategy: Investing in the Health Workforce for Universal Health Coverage. . Pretoria: NDoH, 2020.
200. Daviaud E BD, Budlender D, Sanders D, Kerber K. Saving lives, saving costs: Investment Case for Community Health Workers in South Africa. Cape Town: South African Medical Research Council, 2018.
201. Adepoju PJTLDH. Africa turns to telemedicine to close mental health gap. 2020;2(11):e571-e2.
202. Lund C, De Silva M, Plagerson S, Cooper S, Chisholm D, Das J, et al. Poverty and mental disorders: breaking the cycle in low-income and middle-income countries. 2011;378(9801):1502-14.
203. Ferrari AJ, Norman RE, Freedman G, Baxter AJ, Pirkis JE, Harris MG, et al. The burden attributable to mental and substance use disorders as risk factors for suicide: findings from the Global Burden of Disease Study 2010. PLoS One. 2014;9(4):e91936. Epub 2014/04/04. doi: 10.1371/journal.pone.0091936. PubMed PMID: 24694747; PubMed Central PMCID: PMCPMC3973668.
204. Organization WH. Depression and other common mental disorders: global health estimates. World Health Organization, 2017.
205. Suicide low middle income countries. National Elf Service. 2019.
206. Moosa Y, Jeenah Y, Pillay A, Vorster M, Liebenberg RJSAPR. Non-fatal suicidal behaviour at the Johannesburg General Hospital. 2005;8(3):104-7.
207. Cummins RR, Allwood CW. Suicide attempts or threats by children and adolescents in Johannesburg. S Afr Med J. 1984;66(19):726-9. Epub 1984/11/10. PubMed PMID: 6495121.
208. du Toit EH, Kruger JM, Swiegers SM, van der Merwe M, Calitz FJW, Philane L, et al. The profile analysis of attempted-suicide patients referred to Pelonomi Hospital for psychological evaluation and treatment from 1 May 2005 to 30 April 2006. 2008. 2008;14(1). Epub 2008-03-01. doi: 10.4102/sajpsychiatry.v14i1.40.
209. Borges G, Benjet C, Medina-Mora ME, Orozco R, Nock M. Suicide ideation, plan, and attempt in the Mexican adolescent mental health survey. J Am Acad Child Adolesc Psychiatry. 2008;47(1):41-52. Epub 2008/01/05. doi: 10.1097/chi.0b013e31815896ad. PubMed PMID: 18174824.
210. Knipe DW, Gunnell D, Pieris R, Priyadarshana C, Weerasinghe M, Pearson M, et al. Socioeconomic position and suicidal behaviour in rural Sri Lanka: a prospective cohort study of 168,000+ people. Social psychiatry and psychiatric epidemiology. 2019;54(7):843-55. Epub 2019/02/23. doi: 10.1007/s00127-019-01672-3. PubMed PMID: 30790026; PubMed Central PMCID: PMCPMC6656893.
211. Mokitimi S, Jonas K, Schneider M, de Vries PJ. Child and Adolescent Mental Health Services in South Africa-Senior Stakeholder Perceptions of Strengths, Weaknesses, Opportunities, and Threats in the Western Cape Province. Front Psychiatry. 2019;10:841-. doi: 10.3389/fpsyt.2019.00841. PubMed PMID: 31849722.
212. Petersen I, Lund CJSAMJ. Mental health service delivery in South Africa from 2000 to 2010: one step forward, one step back. 2011;101(10):751-7.

213. Jack H, Wagner RG, Petersen I, Thom R, Newton CR, Stein A, et al. Closing the mental health treatment gap in South Africa: a review of costs and cost-effectiveness. 2014;7(1):23431.
214. Eboreime EA, Abimbola S, Obi FA, Ebirim O, Olubajo O, Eyles J, et al. Evaluating the sub-national fidelity of national Initiatives in decentralized health systems: Integrated Primary Health Care Governance in Nigeria. 2017;17(1):1-13.
215. Brooke-Sumner C, Lund C, Petersen IJIjomhs. Bridging the gap: investigating challenges and way forward for intersectoral provision of psychosocial rehabilitation in South Africa. 2016;10(1):1-15.
216. Petersen I, Marais D, Abdulmalik J, Ahuja S, Alem A, Chisholm D, et al. Strengthening mental health system governance in six low-and middle-income countries in Africa and South Asia: challenges, needs and potential strategies. 2017;32(5):699-709.
217. SAHRC. Report of the National Investigative hearing into the status of mental health care in South Africa. South African Human Rights Commission, 2017.
218. Evans-Lacko S, Hanlon C, Alem A, Ayuso-Mateos JL, Chisholm D, Gureje O, et al. Evaluation of capacity-building strategies for mental health system strengthening in low-and middle-income countries for service users and caregivers, policymakers and planners, and researchers. 2019;5(5).
219. Docrat S, Lund C, Chisholm DJIjomhs. Sustainable financing options for mental health care in South Africa: findings from a situation analysis and key informant interviews. 2019;13(1):1-11.
220. Hauck K, Morton A, Chalkidou K, Chi Y-L, Culyer A, Levin C, et al. How can we evaluate the cost-effectiveness of health system strengthening? A typology and illustrations. 2019;220:141-9.
221. Daviaud E, Kelly G, Cornell J, Geffen L, Solanki GJSAhr. Population ageing in South Africa: trends, impact, and challenges for the health sector. 2019;2019(1):175-82.
222. Prince MJ, Wu F, Guo Y, Gutierrez Robledo LM, O'Donnell M, Sullivan R, et al. The burden of disease in older people and implications for health policy and practice. Lancet. 2015;385(9967):549-62. Epub 2014/12/04. doi: 10.1016/s0140-6736(14)61347-7. PubMed PMID: 25468153.
223. Wimo A, Guerchet M, Ali G-C, Wu Y-T, Prina AM, Winblad B, et al. The worldwide costs of dementia 2015 and comparisons with 2010. Alzheimers Dement. 2017;13(1):1-7. Epub 2016/08/29. doi: 10.1016/j.jalz.2016.07.150. PubMed PMID: 27583652.