

Mental Health Economics Quantifying Productivity Losses Due to Mental Health Conditions in Kenya

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Agenda

01 Kenya's burden burden

Start with the national evidence on the cost of mental health conditions and the share linked to lost productivity.

02 Measuring productivity

Compare the Human Capital Approach and Friction Cost Method, then show an illustrative worker-level calculation.

03 A proposed metric metric

Bring absenteeism, presenteeism and premature mortality into one proposed Mental Health Productivity Productivity Index.

04 Where actuaries actuaries can use it

Translate the measure into applications for insurance, employers and public-sector decision making.

Why productivity matters

The Kenyan evidence shows that the economic cost of mental health conditions extends well beyond direct healthcare spending.

Kenya's 2021 Mental Health Investment Case

KES 62.2B

Total annual economic burden

0.6% of 2020 GDP

KES 56.6B

Lost productivity

Premature mortality, absenteeism
and presenteeism

KES 5.5B

Healthcare expenditure

Direct health-system spending
included in the investment case

The Mental Health Investment Case was an economic analysis commissioned to assess the costs of mental health conditions and the potential economic returns from investing in treatment and prevention.

About 91% of the annual cost was attributed to productivity losses rather than healthcare expenditure.

Source: Kenya Mental Health Investment Case 2021, Government of Kenya / WHO.

The workplace is an important part of the economic burden

12B

Working days lost globally each
year

Depression and anxiety alone

US\$1T

Annual global productivity cost

Depression and anxiety

13%

Share of Kenya's disease burden

Attributed to mental illness in
the 2020 Mental Health
Taskforce report

The workplace link

Mental health can affect attendance, performance and the ability to remain in work.

Sources: WHO, Mental Health at Work (2024); Kenya Mental Health Taskforce Report (2020).

The productivity estimate in the Kenyan investment case has three main components

Absenteeism

Working days not attended because of a mental health condition.

Observed through absence records or survey evidence.

Presenteeism

Reduced output while the employee remains at work.

usually requires an efficiency or performance-loss assumption.

Premature mortality

Future productive years lost when a worker dies earlier than expected.

Requires a projection of future earnings or output and discounting.

These components behave differently when we value them over time, which is where the choice of method matters.



How productivity loss can be valued

The Human Capital Approach and Friction Cost Method answer the same economic question from different assumptions about what happens when a worker becomes unavailable.

Human Capital Approach

Values the productive capacity that is lost over time

Illustrative structure

$$L_HCA = W \times (d / D + p) + PV(\text{future earnings lost through premature mortality})$$

- W** Annual earnings / output proxy
- d** Absence days attributable to the condition
- D** Working days available in the year
- p** Proportion of output lost through presenteeism
- PV** Present value of future earnings lost through premature mortality

What the method captures

- Absenteeism
- Presenteeism
- Future earnings associated with premature mortality

Rice & Cooper (1967); application adapted in the paper to a multi-period present-value framework.

Illustrative HCA calculation: every step is shown from annual loss to total present value

32-year-old marketing officer | KES 840,000 salary | 20 absence days | 30% presenteeism | 7% growth | 12% discount | 5-year term

01

Absenteeism

$$20 / 260 \times 840,000$$

= 64,615 p.a.

02

Presenteeism + annual loss

$$30\% \times 840,000$$

$$252,000 + 64,615$$

= 316,615 p.a.

03

5-year morbidity PV

$$\text{PV factor} = 1 + 0.9554 + 0.9127 + 0.8719 + 0.8330$$

$$4.573 \times 316,615$$

= 1.448M

04

Premature mortality PV

$$28 \text{ years to age } 60$$

$$840,000 \times [1 - (1.12)^{-28}] / 0.12$$

= 6.707M

Total HCA loss = KES 1.448M + KES 6.707M = KES 8.155M ≈ KES 8.2M per worker

Illustrative calculation only. The mortality stream uses level current earnings; the 7% growth assumption is applied to the 5-year morbidity stream.

Friction Cost Method: measure the disruption until work capacity is restored

$$L_{FCM} = W \times (f / D) \times (1 + c_r + c_t)$$

- W** Annual earnings / output proxy
- f** Friction period until the replacement is fully productive
- D** Working days in the year
- c_r** Recruitment cost as a share of annual earnings
- c_t** Training / ramp-up cost as a share of annual earnings

What changes relative to HCA?

The loss is limited to the period before a replacement restores capacity. Future earnings after replacement are not counted.

The loss stops once the replacement reaches full productivity.

Replacement and ramp-up costs become explicit.

Presenteeism is not captured in the same way.

The friction period is therefore a critical calibration assumption.

Illustrative FCM calculation: replacement costs are concentrated in the friction period

Same worker and salary as the HCA example

32-year-old marketing officer | KES 840,000 salary | 20% training | 15% recruitment

01

Output during friction

$\text{KES } 840,000 / 260 \times 65 \text{ days}$

KES 210,000

02

Recruitment

$15\% \times \text{KES } 840,000$

KES 126,000

03

Training / ramp-up

$20\% \times \text{KES } 840,000$

KES 168,000

04

Total FCM loss

$210,000 + 126,000 + 168,000$

KES 504,000

The illustration produces KES 504,000 under FCM versus about KES 8.2M under the full HCA example.

Illustrative assumptions from the paper; friction period 65 days, recruitment 15%, training 20%. These parameters require Kenyan empirical validation.

HCA and FCM give materially different answers because they value different periods of lost capacity

Feature	Human Capital Approach	Friction Cost Method
Core assumption	Future productive capacity remains lost	Replacement restores capacity after friction period
Presenteeism	Can be included	Not captured in the standard form
Time horizon	Can extend to retirement / future earnings	Focused on the friction period
Main strength	Makes long-term productivity effects visible	Recognises substitution and replacement
Main limitation	Can overstate losses where replacement is feasible	Can understate mental-health losses when presenteeism is important

For Kenya, the choice should be tested against the structure of the labour market and the availability of reliable productivity data.

Methodological comparison based on Rice & Cooper (1967) and Koopmanschap & Rutten (1994).

SECTION 03

A practical metric for decision-making

The paper proposes a Mental Health Productivity Index to make productivity effects easier to monitor across an employer, insurer or population.

The proposed Mental Health Productivity Index brings three observable effects into one measure

$$\text{MHPI} = w_1 \times \text{ARI} + w_2 \times \text{PELI} + w_3 \times \text{MALLI}$$

ARI Absenteeism Rate Index

Mental-health-related absence days ÷
possible working days

PELI Presenteeism Efficiency Loss
Index

Share with an active condition × average
efficiency loss

MALLI Mortality-Adjusted Labour
Loss Index

PV of premature mortality earnings loss ÷
total workforce PV

The weights are proposed starting values, not established Kenyan parameters. They should be calibrated using employer, insurer and population data.

. Suggested starting weights: 25% absenteeism, 45% presenteeism, 30% mortality-adjusted loss; sensitivity testing is required.

Illustrative MHPI calculation: the workforce inputs can be followed through to the final index

$$\text{MHPI} = 25\% \times \text{ARI} + 45\% \times \text{PELI} + 30\% \times \text{MALLI}$$

ARI Absenteeism Rate Index

3,900 mental-health-related
absence days
÷ (500 employees × 260 days)
= 3.0%

PELI Presenteeism Efficiency Loss
Index

15% active-condition prevalence
× 30% average efficiency loss
= 4.5%

MALLI Mortality-Adjusted Labour
Loss Index

KES 21.96bn premature-mortality
PV
÷ KES 71.35tn total workforce PV
= 0.0308%

Final calculation: $(0.25 \times 3.000\%) + (0.45 \times 4.500\%) + (0.30 \times 0.0308\%) = 2.784\% \approx 2.8\%$

Illustrative employer-level example: 500 employees and 260 working days. The 3,900 absence days and workforce PV figures are illustrative inputs; the weights are proposed starting values.

The MHPI would need linked data from health, employment and financial records

Health / claims data

Diagnosis and treatment patterns
Disability and recovery experience
Mental-health benefit utilisation



HR / workplace data

Absence days
Workforce exposure
Turnover and retention
Productivity or performance measures



Economic data

Payroll / earnings
Replacement and training costs
Mortality assumptions
Discount and salary growth assumptions

The practical test is data quality: if absenteeism, presenteeism and recovery are not measured consistently, the index will look precise without being reliable.

Proposed data architecture; inputs should be assessed for availability, consistency, privacy and representativeness before modelling.

The same measure can support several actuarial and management decisions

Group health pricing

Use MHPI trends to understand mental-health-related utilisation and productivity risk alongside claims experience.

- › MHPI as loading factor on base premium
- Mental health loading = Base × MHPI × Sector scalar
Example: KES 230/member/year (financial services)

Disability Reserving and income protection

Use recovery and mortality-related components to strengthen assumptions around duration, incidence and economic impact. MALLI scales reserve upward for mental health claimants

Reserve = Monthly benefit × Recovery-adjusted annuity × MALLI factor
Prevents systematic under-reserving across portfolio

Employer risk monitoring

Track changes in absence, presenteeism and workforce impact over time and identify areas where interventions may be worthwhile.

Monthly mental health cost = Total payroll × MHPI / 12

KES 420M payroll → KES 974,400/month lost

Translates clinical risk into CFO-readable KES figure

Public-sector planning

Translate changes in mental-health burden into longer-term economic costs and potential benefits from prevention or treatment.

- › Optimal investment = MHPI × GDP × Treatment efficacy
- › Kenya: KES 11.7B optimal vs KES 99.6M budgeted
- › Gap of KES 11.6B — expressed in fiscal language

The index is most useful when it changes a decision, not simply when it produces another number.

The Kenyan investment case already shows that prevention and treatment can generate economic returns

KES 625.8B

20-year economic benefits

Across the assessed intervention packages

KES 209.5B

20-year implementation costs

Same investment case

Return on investment

Depression 5.1×

Anxiety 3.8×

Alcohol use disorder 2.7×

The case for better measurement is therefore practical: better estimates can help compare the cost of inaction with the cost of intervention.

Source: Kenya Mental Health Investment Case 2021. Benefits and costs are the study's 20-year economic estimates.

The Actuarial Profession's Role

Four areas where actuaries can lead:

1. Data Infrastructure:

Partner with insurers, employers and MoH to build the claims and productivity datasets needed to price mental health risk with actuarial credibility

2 . Product Development:

Design mental health benefit structures in group health and life products that are actuarially sound, viable, and consistent with Kenya Mental Health Policy

3. Public Finance Advisory:

Engage with government and IRA Kenya to develop actuarially informed frameworks for mental health financing within the Social Health Insurance structure

4. Professional Education:

Integrate mental health economics into actuarial training and CPD to build profession-wide capability in this emerging risk domain



A practical role for actuaries is to build the evidence needed to make the measure credible

- 1 Define the measures** Agree consistent definitions for absence, presenteeism, recovery and mortality-related productivity loss.
- 2 Build the data** Link claims, HR, payroll and population data while maintaining appropriate governance and privacy controls.
- 3 Model the uncertainty** Test assumptions around salary growth, discounting, friction periods, replacement and productivity loss.
- 4 Connect to decisions** Use the results to support pricing, reserving, workforce planning and investment decisions where the evidence is strong enough.

The immediate opportunity is not to create a new product. It is to make the economic consequences of mental health measurable enough to support better decisions.

What this paper adds

- 1 The Kenyan economic burden is material.**

The 2021 investment case estimated KES 62.2 billion in annual costs, with about KES 56.6 billion linked to lost productivity.
- 2 Method choice changes the estimate.**

HCA and FCM produce very different results because they make different assumptions about replacement and the time over which losses persist.
- 3 The proposed MHPI gives the work a repeatable structure.**

Absenteeism, presenteeism and premature mortality can be tracked together, provided the weights and inputs are validated.
- 4 The next step is empirical testing.**

The framework should be tested with Kenyan insurer, employer and population data before it is used in formal actuarial decisions.

Thank You.

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