Global Mental Health 1

Poverty and mental disorders: breaking the cycle in low-income and middle-income countries

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Growing international evidence shows that mental ill health and poverty interact in a negative cycle in low-income and middle-income countries. However, little is known about the interventions that are needed to break this cycle. We undertook two systematic reviews to assess the effect of financial poverty alleviation interventions on mental, neurological, and substance misuse disorders and the effect of mental health interventions on individual and family or carer economic status in countries with low and middle incomes. We found that the mental health effect of poverty alleviation interventions was inconclusive, although some conditional cash transfer and asset promotion programmes had mental health benefits. By contrast, mental health interventions were associated with improved economic outcomes in all studies, although the difference was not statistically significant in every study. We recommend several areas for future research, including undertaking of high-quality intervention studies in low-income and middle-income countries, assessment of the macroeconomic consequences of scaling up of mental health care, and assessment of the effect of redistribution and market failures in mental health. This study supports the call to scale up mental health care, not only as a public health and human rights priority, but also as a development priority.

Introduction

There is growing international evidence that mental ill health and poverty interact in a negative cycle.[1] This cycle increases the risk of mental illness among people who live in poverty and increases the likelihood that those living with mental illness will drift into or remain in poverty. Although the evidence for this pattern in high-income countries is fairly robust,[1–3] only in the past two decades have emerging epidemiological data confirmed the trend in low-income and middle-income countries.[4,5] Longitudinal data remain sparse and precise causal mechanisms are difficult to identify. Nevertheless, two principal causal pathways have been postulated. According to the social causation hypothesis, conditions of poverty increase the risk of mental illness through heightened stress, social exclusion, decreased social capital, malnutrition, and increased obstetric risks, violence, and trauma.[4–6] Conversely, according to the social selection or social drift hypothesis, people with mental illness are at increased risk of drifting into or remaining in poverty through increased health expenditure, reduced productivity, stigma, and loss of employment and associated earnings.[3] The social causation pathway might apply more readily to common mental disorders such as depression, whereas the social selection hypothesis might be more applicable to disorders such as schizophrenia and intellectual disabilities.[3] However, these pathways are complex and evidence suggests that they move in both directions for most mental, neurological, and substance misuse disorders.

Key messages

- Mental ill health and poverty interact in a negative cycle in low-income and middle-income countries.
- To break this cycle, interventions are needed that address both the social causes of mental illness and the disabilities and economic deprivation that are a consequence of mental illness.
- On the basis of data from two systematic reviews, we found that the mental health effect of poverty alleviation interventions was inconclusive, although some conditional cash transfer and asset promotion programmes showed mental health benefits.
- By contrast, mental health interventions were associated with improved economic outcomes in all studies, although the difference was not statistically significant in every study. Improvements in economic status go hand in hand with improvements in clinical symptoms, creating a virtuous cycle of increasing returns.
- The findings support the call to scale up mental health care and include mental health on international development agendas.

The WHO Mental Health and Development report[7] emphasised the importance of mental health as a development issue in countries with low and middle incomes, providing compelling evidence that people with mental disorders constitute a vulnerable group who need to be targeted in development assistance. A UN General Assembly Declaration on global health and foreign policy welcomed this report, and recognised that mental health problems have "huge social and economic costs".[8] This challenge begs the question: what interventions are needed to break the cycle of poverty and mental ill health in these countries? More specifically, should such interventions target the economic circumstances of people who live in poverty, and through increasing access to financial resources attempt to improve mental health outcomes of populations (intervening in the social

causation pathway); or should they target the symptoms and disabilities associated with mental ill health, thus improving the "capabilities"[9] of people living with mental illness to participate in economic activity (intervening in the social drift pathway)?

Little is known about the strength of the evidence for these interventions. Yet, such questions are important in the context of the Millennium Development Goals (MDGs) and calls to include mental health in the MDGs and subsequent international development targets.[10,11] If mental health is to be included in future development targets beyond 2015, assessment of the evidence base and feasibility of interventions that attempt to break the cycle of poverty and mental ill health is important.

We undertook two systematic reviews to address these questions. The objective of Review 1 was to assess the effect of poverty alleviation interventions on mental, neurological, and substance misuse disorder outcomes in countries with low and middle incomes. The objective of Review 2 was to assess the effect of mental health interventions on individual and family or carer economic status in these countries. Panel 1 presents the methods used in both systematic reviews. For both reviews, heterogeneity of methods, instrumentation, study settings, interventions, outcomes, populations, and analyses precluded an attempt to draw summary estimates of effect size. Instead, we present a qualitative summary of findings.

Combating social causation: poverty alleviation interventions and their mental health effect

Description of studies

Figure 1 shows the literature search process for Review 1. Five reports were included in the review. These reports related to four studies undertaken in four countries: one study of a conditional cash transfer programme in Mexico,[17,18] one of unconditional cash transfers in Ecuador,[19] one of small loans in South Africa,[20] and one of an asset promotion intervention in Uganda.[21] Reports were grouped into one study if the interventions were defined in the same way at multiple follow-up times and if findings referred to the same study population. All studies were randomised controlled trials, in which the intervention was randomly assigned either at a cluster level (eg, household or family) or at the individual level. In one case, the study was based on a subset of a randomised trial.[21] No non-randomised longitudinal intervention studies met the inclusion criteria.

Table 1 shows study characteristics and main findings. Of the nine mental health outcomes assessed, two were perceived stress in adults, two adult depression, two childhood cognitive development, two childhood behaviour problems, and one adolescent self-esteem. Mental health outcome tools included a range of developmental, behavioural, and mood assessment measures. Cash transfer studies assessed both child and adult outcomes. Follow-up for the studies varied between 6 months and 10 years. No studies were identified on the effects of poverty alleviation interventions on substance misuse. Although no time limitations were placed on the search, all the studies were published from 2007 onwards.

Effect on mental health status

The mental health effect of these poverty alleviation interventions was varied. In children, conditional cash transfer evaluations after 10 years comparing early recipients and later recipients of the *Oportunidades* programme in Mexico showed a significant effect on reduction of behavioural problem indices but a non-significant effect on cognitive scores.[18] When the same intervention was assessed as a continuous outcome (total amount of cash received) after 5 years, a significant improvement in all cognitive assessments was associated with the intervention.[17] The small loans intervention in South Africa was associated with an increase in stress levels among programme participants 6 months after the end of the intervention; results for depressive symptoms were non-significant.[20] The evaluation of the unconditional cash transfer programme in Ecuador did not note any significant effects of the programme on children's cognitive and behavioural outcomes or caregivers' depression indices after 2 years.[19] Finally, the asset promotion programme in Uganda reported positive effects on schoolchildren's self-esteem after 10 months.[21]

Discussion

The scarcity of data makes it difficult to draw clear conclusions. There are some indications that conditional cash transfers and asset promotion are more clearly associated with mental health benefits than are other poverty alleviation interventions. The unconditional cash transfer programme had no significant mental health effect for children or adults, and the microcredit intervention had negative consequences, increasing stress levels among recipients. The negative findings in South Africa are consistent with other recent findings that microcredit programmes can entrench poverty for some groups in sub-Saharan Africa[22] and increase risk of common mental disorders among poor mothers in Andhra Pradesh, India.[23] Some microcredit programmes have had mixed mental health effects; for example, the Bangladesh Rural Assistance Committee (BRAC) showed no effect on women's emotional stress[24] and a significant improvement in mental health items of the 36-item short-form health survey among poor BRAC members compared with poor non-members ($p=0·038$).[25] The findings suggest that intervention effects are greatly dependent on the precise nature of the intervention (eg, whether the intervention is a loan, a conditional cash transfer, or an unconditional cash transfer; the level of input, for example amount of cash; and the level of active involvement required from participants), the mental health outcome being assessed, and the context. With respect to causal mechanisms, the scarce evidence for

Panel 1: **Methods for Reviews 1 and 2**

Inclusion criteria for Review 1, social causation: do poverty alleviation interventions improve mental, neurological, and substance disorder outcomes in low-income and middle-income countries?

- Individual and cluster randomised controlled trials and non-randomised intervention studies undertaken in low-income and middle-income countries were included if they reported a quantitative estimate of the effect of a financial poverty alleviation intervention on priority mental, neurological, and substance misuse disorder outcomes as identified by mental health Gap Action Programme (mhGAP),[12] including mental and substance misuse disorders and epilepsy, as well as psychological measures that have been shown to predict some mental, neurological, and substance misuse disorder outcomes such as psychological distress[13] and self-esteem.[14] Studies were excluded if the condition of interest was not a mental health problem, substance misuse, or epilepsy (eg, stroke, multiple sclerosis, or other neurological condition), and if the study used a case-control or cross-sectional method.
- Interventions were included if they aimed to improve an individual's poverty status, and included: cash transfers, microfinance, loans, social insurance, debt management, and financial services. In-kind interventions, such as food relief or nutrition supplementation, as well as employment and educational interventions, were excluded for two reasons: first, because we wished to focus on financial interventions, and including these would introduce a wide range of interventions, with varying causal mechanisms from which it would be difficult to draw clear conclusions; and second, because these would relate to a range of policy recommendations in a range of different sectors.

Inclusion criteria for Review 2, social drift: do mental health interventions improve individual and family or carer economic status in low-income and middle-income countries?

- Individual and cluster randomised controlled trials and non-randomised intervention studies undertaken in low-income and middle-income countries were included if they reported a quantitative estimate of the effect of an intervention to improve mental health on the economic status of either the individual receiving the intervention (of any age) or their family or carers. All priority mental, neurological, and substance disorder outcomes as identified by mhGAP consisting of mental and substance misuse disorders and epilepsy were included.[12]
- Interventions of any type (pharmacological, psychological, and psychosocial) were included if their aim was to improve the lives of people with mental, neurological, and substance misuse disorders and their families. This definition includes but is not limited to pharmacological interventions, psychological therapies, social skills training, supported employment, psychoeducation, and other educational measures to improve social (as opposed to purely health) outcomes. Studies were included if they compared the intervention with a placebo or treatment as usual control group, or for non-randomised intervention studies without a comparison group, if they provided before and after estimates of the outcome. Comparisons of two active treatments (such as two drug treatments or two psychological therapies) were excluded to estimate the effect of removal of the treatment gap on economic status.
- Economic status outcomes consisted of direct measures of the economic status of individuals and families, as opposed to indirect measures, which could be used to infer economic status such as depression-free days and disability scores. Examples of economic status outcomes include: employment status (eg, occupation, including homemaking for women, unemployment, number of lost work days), finances (eg, earnings from employment, household income), and costs of health care (eg, out of pocket expenses for treatment).

Search strategy

- The search was not restricted by date, language, or publication status. We searched the following electronic databases: Medline, PsycInfo, Cochrane Central, Econlit, and ISI Web of Science using Medical Subject Heading (MeSH) terms (or equivalent terms) for published peer-reviewed journal articles. Terms used to capture studies relating to mental illness were "mental disorders" and all terms included in MeSH as subheadings of mental disorders. Terms for capturing economic status were "income", "poverty", "employment", "rehabilitation, vocational", "education", and "educational status". Those for capturing studies undertaken in low-income and middle-income countries were "developing countries", and the names of all the individual countries classified as low-income or middle-income countries by the World Bank. Those for capturing the methodological criteria included the search terms and MeSH headings for "clinical trials", "randomized controlled trial", "prospective studies", "follow-up studies", "comparative study", "randomized", "cohort studies", and "evaluation studies". The last search was done in October, 2010. We also screened the reference lists of all selected papers and contacted authors of relevant studies.
- For Review 1, 28 scholars in the specialty were contacted and asked whether they had personally undertaken any research in this area and whether they knew of other studies that might be relevant. Of the 20 scholars who replied, seven provided potential papers with a total of 16 papers provided. Three of these papers were unpublished, two were already included in the review, and 11 did not meet the inclusion criteria.
- For Review 2, 12 key scholars were contacted, as well as all authors (n=41) of the randomised controlled studies that were documented in the 2007 *Lancet* Series on global mental health, which assessed the effectiveness of interventions for the treatment and prevention of selected

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mental disorders in low-income and middle-income countries.[15] The authors of the randomised trials were asked whether they had done any further trials measuring the economic effect of the mental health intervention since the 2007 *Lancet* publication. Of the 25 *Lancet* authors who responded, 21 indicated that they had not done any further trials and four said that they were currently undertaking trials, the results of which had not yet been published. All 12 of the additional scholars in the specialty who were contacted responded; however, only one provided a potential paper. This paper was, however, still unpublished and thus was not applicable.

Data collection and analysis

- Initial screening of irrelevant abstracts involved one author searching through the database of search results for papers that had nothing to do with mental health (eg, searching for "cancer" or "heart disease" in the title, scanning the title, and then excluding). The authors also did keyword searches for study design—eg, "qualitative" and "prevalence" to exclude non-intervention studies. This method was the most efficient way of ensuring that two people could double screen the relevant results, since our initial search had more than 13 000 results. After the initial screening of search results for irrelevant studies, two authors (CL and SP for Review 1 and MDS and SC for Review 2) independently screened the titles and abstracts of the search results. Full-text copies of all potentially relevant studies were obtained and independently assessed by CL and SP for Review 1 and MDS and SC for Review 2 to establish whether they met the inclusion criteria. Non-English language papers were translated before being tested for inclusion. Data were extracted from included studies using a standard data extraction form by one author (SP and SC for Review 1 and 2, respectively), and data extraction checked by a second author (CL and MDS, respectively). The quality of included studies was assessed with the Cochrane Risk of Bias Tool for randomised controlled trials and the Effective Public Health Practice Project tool for all other study designs. Quality assessment was undertaken by one author (SP and SC for Review 1 and 2, respectively), and checked by a second author (CL and MDS, respectively). Using the Cochrane Risk of Bias Tool,[16] we found some studies to have high risk of bias in some domains, but these risks did not substantially compromise the validity of the findings of these studies. In Review 2, the quality of the non-randomised intervention study was strong, but two of the three before-and-after cohort studies were judged to be weak, largely because of selection bias resulting from the selection of the cohort or large losses to follow-up.

Limitations of review

- Although we included studies published in any language, only search terms in English were used and the databases predominantly reported English language studies, so we are likely to have missed some studies that were not published in English. Additionally, the mental health outcomes of poverty alleviation programme evaluations are not always reported in the peer-reviewed literature. Although concerted attempts were made to uncover available evidence, some studies might therefore have been missed.

poverty alleviation interventions with a financial component do not allow strong conclusions, particularly in view of the complexity of some of the interventions. Evaluations that include an analysis of separate components of the interventions might contribute to a clearer picture—eg, whether the regularity of payments or inputs, their conditionality, or their cumulative amounts are key factors determining mental health outcomes. In our review, only the *Oportunidades* programme evaluated the effect of a specific component, namely the cash component, which did show a benefit for children's cognitive development after 5 years.[17]

The interventions in Review 1 suffer from a problem common to many prevention interventions, namely that they target all people identified as poor within a population, and only intervene with one facet of poverty, primarily finance. In the context of multifaceted poverty and the complex relationship between poverty and mental ill health, such interventions are unlikely to have an effect on mental health unless they address more specific mechanisms of the association between poverty and mental health and target a specific vulnerable subgroup of the population. This idea is supported by findings from observational reports in low-income and middle-income countries suggesting that the strength of the association between poverty and mental health varies for different dimensions of poverty (eg, income versus education deprivation).[4] This variation reinforces the need to monitor mental health outcomes of poverty alleviation programmes (where possible broken down into their multiple components) to identify which aspects can help to prevent mental illness or promote mental health, and which subpopulations might benefit from such interventions.

Of note, four intervention studies that did not meet our inclusion criteria by virtue of only reporting cross-sectional data nevertheless produced interesting findings that corroborate and expand on the findings of the included studies. For example, children who had been in the *Oportunidades* conditional cash transfer programme in Mexico had lower salivary cortisol concentrations (as a proxy for stress levels) than did those who had not participated in the programme, while controlling for a wide range of individual, household, and community-level variables.[26] The effect was stronger among children of mothers with high depressive symptoms ($p<0·001$). Similarly, the *Oportunidades* programme was associated with a 10% decrement in aggressive or oppositional symptoms among children, although there was no

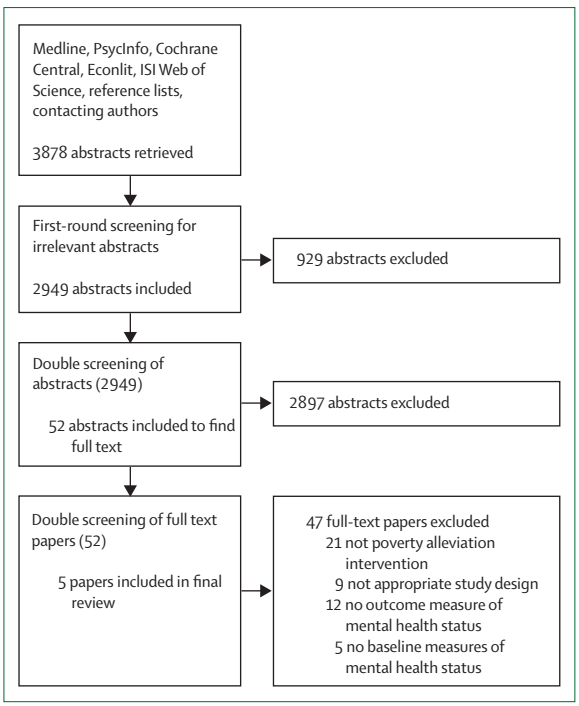

Figure 1: **Summary of literature search for Review 1**

significant difference in anxiety or depressive symptoms in children, or in total problem behaviours, while controlling for covariates.[27] In Malawi, unconditional cash transfers led to a 38% reduction in psychological distress among schoolgirls, assessed with the General Health Questionnaire (GHQ-12).[28] In South Africa, the depression index of household members in the Langeberg rural area was lower the greater the number of pensioners in the household, while controlling for the presence of household members who were eligible for pensions, suggesting an independent effect of pension income on depression.[29]

The findings are consistent with some high-income country findings; for example, the evaluation of a natural experiment in the USA found that income supplementation had an effect on older children's and young adolescents' aggressive or oppositional, but not anxiety or depressive symptoms.[30] However, the small number of studies, wide range of populations and ages, varied interventions, and range of mental health outcomes make synthesis difficult and limit the conclusions that can be drawn.

Preventing social drift: mental health interventions and their economic effects

Description of studies

Figure 2 shows the literature search process for Review 2. Nine reports were included in the review. The included studies varied substantially in terms of study design, population, intervention assessed, and outcomes. The studies were undertaken in six countries, with three studies from China, one from Thailand, two from India, one from Uganda, one from Nigeria, and one from Iran. There were five randomised controlled trials, one non-randomised intervention study, and three before-and-after cohort studies. Of the 11 interventions evaluated by the nine studies, three were psychiatric drugs, two were community-based rehabilitation programmes including psychotherapy and psychiatric drugs, two were individual or group psychotherapy, two were residential drug-treatment programmes, one was family psychoeducation (provided once per month for 9 months), and one was epilepsy surgery. Family psychoeducation involved providing the family and the patient with basic information about mental illness, treatment, and rehabilitation, and was tailored to the specific condition of the patient, their symptoms, prognosis, treatment recommendations, and long-term management. Of the 18 economic status outcomes assessed, 13 assessed the effect on the individual patient and included measures of employment status (such as unemployment, employment duration, or type of employment) or culturally validated measures of ability to undertake locally relevant economic activities (such as farming or growing food). Five measured the effect on the family including the effect on family finances, the effect on the working patterns of non-ill family members and the health-care costs of the intervention to the patient and family.

Effect on economic status

Table 2 summarises the characteristics and main findings of all studies included in the review. Of the 19 associations tested, ten showed the intervention to have a significant positive effect on economic status and nine a non-significant positive effect (or no tests of significance were provided). No study showed a mental health intervention to have a significant negative effect on economic status.

The three studies on interventions for depression were all randomised controlled trials. Group interpersonal psychotherapy for depression was associated with significant improvements in women's but not men's daily economic tasks in Uganda.[31] Family-based community rehabilitation including drug treatment and psychoeducation significantly decreased family economic burden, increased family employment, and increased the working ability of the patient in China.[32] Antidepressant treatment showed a non-significant reduction, and individual psychological therapy a non-significant increase, in family out-of-pocket payments for treatment in India.[33]

Two of the three studies on interventions for psychosis were randomised controlled trials, one of which showed a significant positive effect of the intervention on economic status. Community-based rehabilitation in China including drug treatment and family psychoeducation had a significant positive effect on duration of employment and the burden on family finances, but no effect on non-ill family members' working patterns[35] or

	Study design	Participants	Economic intervention and control groups	Mental health outcomes	Timing of outcome assessment	Risk of bias*	Summary of findings
Fernald (2008),[20] South Africa	Individual RCT	Previously "marginally rejected" applicants for small loans (N=237 adults)	Intervention: second chance to receive a small loan after previously being rejected as marginally ineligible; loan to be repaid at 11·75% monthly interest over 4 months (n=109) Control: no loan offered (n=128)	(1) 20-item CES-D (2) Cohen's Perceived Stress Scale (10-item)	6–12 months	1 High 2 High 3 Low 4 Low 5 Low 6 Low	There was no significant association between randomisation to the treatment group and depressive symptoms: CES-D (intervention *vs* control), β=0·20† (95% CI −0·80 to 0·41), p>0·05 Participants who were randomly assigned to receive a second chance for a loan had significantly higher levels of perceived stress than did those in the control group: high stress symptoms, treatment versus non-treatment regression coefficient, β=0·78† (CI 0·13 to 1·43), p<0·05
Fernald (2008),[17] Mexico	Cluster RCT	Children in households in low-income communities (N=2449)	*Oportunidades*, conditional cash transfer programme (requiring compliance with school and clinic requirements) Intervention: doubling of cumulative cash transfers from the median of 7500 to 15 000 pesos Control: median of cumulative cash transfers	(1) Woodcock-Muñoz cognitive development test, 5·5 years after programme inception	4–5 years	1 Low 2 Unclear 3 Unclear 4 Low 5 Unclear 6 Low	A doubling of cash transfers was associated with significant improvements in all cognitive assessments: long-term memory (intervention *vs* control), β=0·12‡ (95% CI 0·04 to 0·19), p=0·002; short-term memory, β=0·13 (95% CI 0·07 to 0·19), p<0·001; visual integration, β=0·08 (95% CI 0·01 to 0·14), p=0·02
Fernald (2009),[18] Mexico	Cluster RCT	Children in households in low-income communities (N=1793)	Intervention: *Oportunidades*, conditional cash transfer programme (requiring compliance with school and clinic requirements), early intervention (1998; n=1093 children aged 8–10 years from 1052 households) Control: intervention, 18 months later (n=700 children aged 8–10 years from 673 households)	(1) Wechsler abbreviated scale of intelligence (2) Strengths and difficulties behaviour score	9–10 years	1 Low 2 Unclear 3 Unclear 4 Low 5 Unclear 6 Low	Treatment effects on cognitive assessment were non-significant: cognitive assessment score (intervention *vs* control), β=−1·19§ (95% CI −3·26 to 0·29), p>0·05 Positive treatment effects on behavioural problems were small but statistically significant: behaviour problems score (intervention *vs* control), β=−0·14 (95% CI −0·27 to −0·01), p=0·03
Paxson (2007),[19] Ecuador	Cluster RCT	Children and their mothers in low-income families (N=118 administrative units or parishes, consisting of 1124 families with 1479 children)	Intervention: Bono de Desarrollo Humano unconditional cash transfer programme (n=79 parishes) Control: delayed receipt of the programme (n=39 parishes)	(1) Aggregate children's cognitive and behavioural outcome measure (based on Woodcock-Johnson-Muñoz scale) (2) 20-item CES-D in mothers	2 years	1 High 2 Unclear 3 Unclear 4 Low 5 Unclear 6 High	The average overall programme effects on children's cognitive and behavioural measures were small and not statistically significant: cognitive and behavioural children's outcomes (intervention *vs* control), *Z* score=0·114¶ (SE 0·060); effect estimates were greatest in the subset of children in the lowest expenditure quartile Treatment effects for the mental health of mothers in the poorest quartile were non-significant: CES-D (intervention *vs* control), *Z* score=0·212 (SE 0·163)
Ssewamala (2009),[20] Uganda	Individual RCT (subsample analyses)	AIDS-orphaned children (aged 11–17 years; N=268)	Intervention: economic empowerment programme designed to promote asset accumulation for families (n=131) Control: children who received "usual reactive care" including recreation services (a place to learn and play), counselling, and provision of food aid (n=137)	TSCS 2	10 months	1 Unclear 2 Unclear 3 Unclear 4 High 5 Unclear 6 Low	Participants who received the intervention reported higher self-esteem at the 10-month follow-up than did the control group: mean difference in standardised TSCS score‖ (intervention *vs* control), 3·48 (95% CI 0·42 to 6·55), p<0·05

RCT=randomised controlled trial. CES-D=Center for Epidemiologic Studies Depression Scale. TCSC=Tennessee Self-Concept Scale. *Study quality of RCTs assessed by the Cochrane Risk of Bias Tool; the Cochrane Risk of Bias Tool assesses the study across six domains and does not generate a global score of quality; key to Cochrane Risk of Bias criteria: 1=adequate sequence generation, 2=allocation concealment, 3=blinding, 4=incomplete outcome data, 5=selective outcome reporting, 6=other sources of bias. †β coefficient of treatment effect (multinomial probit regression). ‡Coefficient of treatment effect associated with doubling of cash transfers (multivariate linear regression). §Coefficient of treatment effect (multivariate logistic regression). ¶*Z* scores were calculated by subtracting the sample median and dividing by the SD of the control group. ‖The total scores (out of 80) of the TSCS were standardised with *t* scores, which have a mean of 50 and an SDof 10.

Table 1: **Summary of studies included in Review 1 (do poverty alleviation interventions improve mental, neurological, and substance disorder outcomes in low-income and middle-income countries?)**

the patients' ability to work.[34] A non-randomised intervention study in India showed a reduction in work-related disability among participants who were prescribed antipsychotic drugs.[36]

The two cohort studies that evaluated the effect of residential treatment programmes for substance misuse in Iran[37] and Nigeria[38] showed improvements in employment status as a result of the intervention, but no tests of significance were provided, and both studies had biases that might have affected their results. The cohort study evaluating the effect of successful epilepsy surgery on multiple dimensions of employment status identified very large significant increases in productive work, average income, and job status.[39]

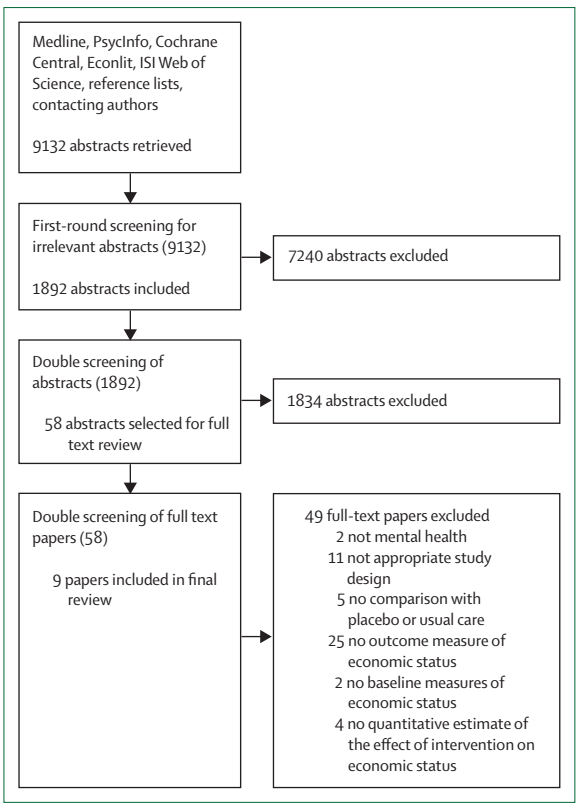

Figure 2: **Summary of literature search for Review 2**

Discussion

The findings of this review show a clear trend in which mental health interventions are associated with improved economic outcomes in low-income and middle-income countries. All studies showed an economic benefit, although the difference was not statistically significant in every study. Whether some of the interventions included in the review, although effective in improving economic and clinical outcomes, would be suitable for scaling up in resource-poor settings is questionable. Five of the interventions are complex and involved both drug treatment and psychological therapy delivered over a period of months as either an outpatient[32,34,35] or inpatient,[37,38] and one involved surgery for epilepsy delivered in a tertiary health-care setting.[39] The drug treatment and psychosocial interventions have low compliance rates, which could affect the ability of the intervention to improve economic status outcomes. For example, only 53% of the intervention group were defined as actively compliant in a Chinese randomised trial of community rehabilitation, and outcomes were better for compliant than for non-compliant patients.[35] Three studies evaluate fairly simple and brief interventions that either were or could be delivered by non-specialist health workers.[31,33,36] Two of these studies showed significant improvements in economic status for small investments,[31,36] and the third showed a significant cost-effectiveness benefit to the health-care provider of antidepressant treatment in improving clinical symptoms.[33]

Improvements in economic status go hand in hand with improvements in clinical symptoms, creating a virtuous cycle of increasing returns. All of the studies that showed a significant effect on economic status also showed a significant improvement in clinical status. These clinical improvements could also account for improvements in family economic status. Both randomised trials that explored the effect on family burden showed that patients in the intervention group had significantly fewer readmissions to hospital, shorter duration of hospital stay, and longer time in gainful employment compared with the control group, accounting for the reduced effect on the family finances in the intervention group.[32,35]

Priorities for future research

Tackling the cycle of mental ill health and poverty is urgent for several reasons. First, the link between income and ill health is stronger for mental health than for general health, as shown in high-income countries such as the UK[40] and South Korea.[41] In the UK, the extent of inequality increased with the severity of mental health problems, with the greatest inequality recorded for psychosis.[40] Second, in response to the present global economic recession, mental health inequalities in populations are likely to worsen. In an analysis of data from South Korea over a 10-year period, Hong and colleagues[41] showed a widening of mental health inequalities after South Korea's major recession in the late 1990s. Worsening macroeconomic circumstances over coming years could exacerbate the already difficult relation between poverty and mental ill health if active policy steps are not taken. In view of the substantial gaps in the discipline identified by this review, establishment of a research agenda for policy interventions that aim to break the cycle of poverty and mental illness in countries with low and middle incomes is important.

The first priority is to undertake an increased number of high-quality intervention studies in countries with low and middle incomes. Despite screening of more than 13 000 titles and abstracts, only five studies were eligible for inclusion in Review 1, and nine in Review 2. Of the 1521 randomised trials of mental health interventions identified in the 2007 *Lancet* Series on global mental health,[15] only four measured economic status outcomes and thus were included in this review, with only one new randomised trial published since 2007 that measured economic status outcomes and therefore could be included in this review.[32] This paucity of studies mirrors findings from other recent systematic reviews of mental health research in low-income and middle-income countries.[15,42] Furthermore, only two of the 14 included studies were set in a low-income country (Uganda), with the remainder from countries with lower-middle and upper-middle incomes. Thus, the effect of mental health and poverty

	Study design	Participants	Mental health intervention and control groups	Economic status outcomes	Timing of outcome assessment	Risk of bias*	Summary of findings
Depression							
Bolton (2003),[31] Uganda	Cluster RCT	284 adults living in the community who met DSM-IV criteria for major or subsyndromal depression, identified through community screening	Intervention: 139 people from 15 villages were randomly assigned to 16 weeks of weekly 90-min sessions of community-based group interpersonal psychotherapy delivered in gender-specific groups of 8–10 people Control: 145 people from 15 villages were randomly assigned to receive usual care	Subscale of social functioning scale: ability to carry out gender-specific locally relevant economic activities (men: farming, manual labour; women: care for children and grow food); scores ranged from 0 (no difficulty) to 4 (often unable to do the task)	2 weeks' post-intervention	1 Low 2 Unclear 3 Low 4 High 5 Low 6 Low	No significant effect on men's economic activities: mean effect on farming, 0·89 (95% CI 0·39 to 1·38) versus 0·73 (0·25 to 1·21), p≥0·05; manual labour, 1·04 (0·57 to 1·51) versus 0·51 (0·12 to 0·90), p>0·05 Significant improvements in the ability of women in the intervention group to undertake economic activities: care for children, 1·74 (1·34 to 2·14) versus 1·17 (0·76 to 1·58), p≤0·05; grow food, 1·28 (0·84 to 1·72) versus 0·56 (0·21 to 0·92), p≤0·05
Hu (2007),[32] China	Individual RCT	Patients with depression admitted to hospital between November, 2002, and November, 2003	Intervention: on discharge, 39 patients were randomly assigned to receive 1·5–2 years of family-based treatment package including drug treatment and psychoeducation Control: 37 patients were randomly assigned to standard outpatient treatment	Perceived effect on family finances and effect on working patterns subscales of the Family Burden Interview Schedule for non-ill family members; score of 0 (no effect) to 3 (very significant effect) Subscale of the social functioning scale: % of time that patient is capable of full-time working	2 years after enrolment	1 Low 2 Unclear 3 Low 4 Unclear 5 Low 6 Unclear	Mean effect on family finances and effect on working patterns of non-ill family members were significantly lower in intervention compared with the control group Mean effect on family finances: intervention, 0·78 (SD 0·61); control, 1·51 (0·83) p≤0·05 Effect on working patterns of non-ill family members: intervention, 0·68 (SD 0·84); control, 1·21 (0·58), p≤0·05 Patients in the intervention group were capable of working for a significantly greater proportion of time than were control patients: intervention, 86·7% (SD 48·1); control, 68·4% (32·1), p≤0·01
Patel (2003),[33] India	Individual RCT	Adults attending general medical outpatient clinic who scored 15 or more on revised Clinical Interview Schedule for depression	Intervention 1: 150 patients were randomly assigned to receive fluoxetine for 6 months Intervention 2: 150 patients were randomly assigned to six sessions of locally developed individual psychological therapy by a trained therapist delivered over 3 months Control: 150 patients were randomly assigned to 6 months of drug placebo	Aggregated patient and family costs, made up of lost work days, informal caregiving by relatives or friends, travel costs, and time spent travelling to or waiting for consultations Semiskilled and unskilled (including housework) occupational categories used to calculate opportunity costs	2, 6, and 12 months after enrolment	1 Low 2 Low 3 Low 4 Unclear 5 Low 6 High	Intervention 1: antidepressants were less costly to patients and families, but this difference was not significant: mean cost per month at 2 months, –163 rupees (95% CI –660 to 399); at 2–12 months, –147 rupees (–536 to 261) Intervention 2: psychological treatments were more costly to patients and families per month than placebo, but this difference was not significant: mean cost per month at 2 months, 103 rupees (95% CI –469 to 732); at 2–12 months, 145 rupees (–271 to 566)
Psychosis							
Ran (2003),[34] China	Cluster RCT	Recent onset and chronic cases of schizophrenia identified through a community survey (DSM-IV criteria)	Intervention 1: 126 patients in two intervention clusters received a family psychoeducation intervention for 9 months plus haloperidol Intervention 2: 103 patients in two intervention clusters received a long-term injection of haloperidol or oral depot, or both Control: 97 patients in two control clusters received treatment as usual	Patient's ability to work full time, part time, or not able to work	End of 9-month intervention	1 Low 2 Unclear 3 Low 4 Unclear 5 Low 6 High	The proportion of patients able to work full or part time was greater in the intervention groups than in the control group, but this difference was not statistically significant (p>0·05) Ability to work full time: intervention 1, 57·9%; intervention 2, 63·1%; control, 54·6% Ability to work part time: intervention 1, 32·6%; intervention 2, 29·1%; control, 29·9% No ability to work: intervention 1, 9·5%; intervention 2, 7·8%; control, 15·5%

(Continues on next page)

	Study design	Participants	Mental health intervention and control groups	Economic status outcomes	Timing of outcome assessment	Risk of bias*	Summary of findings
(Continued from previous page)							
Xiong (1994),[35] China	Individual RCT	Patients admitted to hospital diagnosed with schizophrenia (DSM-lll-R) and living with at least one family member	Intervention: 34 patients were randomly assigned to receive an individualised family-based intervention lasting 1–2 years including monthly 45-min family counselling sessions and 90-min family group sessions, home visits, and drug supervision Control: 29 patients were randomly assigned to receive standard outpatient treatment	Effect on family finances and effect on working patterns subscales of the Family Burden Interview Schedule for non-ill family members; score of 0 (no effect) to 3 (very significant effect) Months of employment for patient	6, 12, and 18 months after enrolment	1 Unclear 2 Unclear 3 Unclear 4 Low 5 Low 6 High	The intervention group reported a significantly reduced effect of the condition on family finances during the whole follow-up period (mean score 1·19 [SD 0·93] *vs* 1·87 [0·85], p=0·0058) There was no significant difference between groups in working patterns of non-ill family members (mean 0·63 [SD 0·73] *vs* 0·93 [0·76], p=0·1001) Patients in the intervention group had significantly more months of employment than did the control group at 18 months (mean 9·5 [SD 7·83] *vs* 4·64 [7·39], p=0·0207), some evidence of more months employment at 12 months (5·55 [5·04] *vs* 3·14 [5·05], p=0·0511), and no evidence of more employment at 6 months (2·18 [2·62] *vs* 1·48 [2·47], p=0·1282)
Thirthalli (2009),[36] India	Non-randomised intervention study	190 people with schizophrenia living in the community and recruited for the Community Intervention in Psychotic Disorders project and followed up for 1 year of treatment	Community-based antipsychotic drug treatment; treatment given by study team or from private psychiatrists practising in the region Cohort divided into three groups: on-on group (n=85; on treatment at baseline and follow-up); off-on group (n=72; off treatment at baseline and on treatment at follow-up); and off-off group (n=33; off treatment at baseline and off treatment at follow-up)	Work disability subscale of Indian Disability Evaluation and Assessment Scale; score of between 0 (no disability) and 4 (profound disability)	1 year	Strong quality	Mean work disability scores remained almost unchanged in those who never received treatment, but decreased significantly (reduction in disability) in those who continued to receive antipsychotics and in those in whom treatment was initiated Mean score: off-off group, 2·83 (SE 0·26) at baseline, 2·77 (0·23) at follow-up; on-on group, 1·82 (0·16) at baseline, 0·9 (0·14) at follow-up; off-on group, 2·56 (0·17) at baseline, 1·3 (0·15) at follow-up; *F* (group effect)=14·23, p<0·01
Substance misuse							
Abdollahnejad (2008),[37] Iran	Before and after study (cohort)	43 men recovered from opium or heroin addiction who had completed 6 months of treatment in the community	6-month residential therapeutic community treatment; three main phases of treatment known as orientation, treatment, and re-entry; included training classes and group therapies (including encounter groups, cognitive behaviour therapy groups, music therapy groups, family training classes, family therapy groups, and vocational counselling)	Employment status (a lower score shows a greater employment rate)	3 years	Weak quality	Scores for employment improved at both discharge and follow-up; mean employment status score preintervention was 1·55, 1·58 postintervention, and 0·66 at 3 years' follow-up (upper bound 1·01, lower bound 0·31); no significance tests were provided
Lawal (1998),[38] Nigeria	Before and after study (cohort)	80 patients with heroin or cocaine dependence admitted to the Lagos Psychiatric Hospital Drug Rehabilitation Unit	4-week hospital-based drug rehabilitation programme including detoxification, treatment of associated physical conditions, daily group sessions, occupational and vocational rehabilitation	Employment status (employed *vs* unemployed)	1 year	Weak quality	There was little change in employment status with only three of the 49 people unemployed at baseline gaining employment by 12 months' follow-up (no tests of significance)
Epilepsy							
Locharernkul (2005),[39] Thailand	Before and after study (cohort)	111 epileptic patients who had become seizure-free, almost seizure-free, or had worthwhile improvement after surgery	Epilepsy surgery	Change in employment status, income, and job categories	6 months to 3 years	Moderate quality	Compared with presurgery, at follow-up the proportion who had no productive work decreased by 90% (p<0·001); the proportion who had no income decreased by 61% (p<0·001); average income increased by 45% (p≤0·001); and those with professional jobs and regular salaries increased by 54% (p<0·001)

RCT=randomised controlled trial. DSM=Diagnostic and Statistical Manual of Mental Disorders. *Study quality of RCTs assessed by the Cochrane Risk of Bias Tool and for non-RCTs by the Effective Public Health Practice Project (EPHPP) tool; the EPHPP assesses study quality across eight domains and generates a global score of quality of weak, moderate, or strong; the Cochrane Risk of Bias Tool assesses the study across six domains and does not generate a global score of quality; key to Cochrane Risk of Bias: 1=adequate sequence generation, 2=allocation concealment, 3=blinding, 4=incomplete outcome data, 5=selective outcome reporting, 6=other sources of bias.

Table 2: **Summary of studies included in Review 2 (do mental health interventions improve individual and family or carer economic status in low-income and middle-income countries?)**

Panel 2: **Recommended features of future intervention studies addressing the poverty and mental illness cycle in countries with low and middle incomes**

Poverty alleviation intervention studies should:

- Include locally valid mental health outcome measures, preferably pertaining to so-called hard assessment of mental, neurological, and substance misuse disorders such as screening tools for specific disorders or groups of disorders, rather than soft measures such as stress and self-esteem. Although stress and self-esteem are predictive of mental, neurological, and substance misuse disorder, they are likely to provide less robust assessments of disability and distress. Where relevant, suicide outcomes should also be assessed—a measure that might have assisted, for example, in more rigorous evaluation of microfinance interventions in Andhra Pradesh, India.[43]
- Use precise measures of the causal mechanisms to be tested; for example, the conditionality of cash transfers, the volume of the intervention, and local contextually relevant factors.
- Target specific vulnerable populations who might yield the greatest mental health gains from a particular intervention; for example, cash transfers for adolescent girls in some settings such as Malawi might reduce their reliance on engaging in transactional sex to generate income, and hence improve their mental health status.[28]

Mental health intervention studies should:

- Include robust, locally relevant, and multidimensional outcome measures of economic status. Outcome measures in Review 2 were often one-dimensional (eg, employed *vs* unemployed) and did not capture the nuances of an individual's or family's economic status such as type of job or hours worked. Such distinctions are crucial in the context of evidence for improved outcomes for people with psychosis in low-resource settings.[44] Detailed measures of employment status show that crude measures such as employed or unemployed mask a change in working patterns towards low paid, unskilled work,[45-47] compounded by social pressure for men to be the primary wage earner in settings where there is an absence of social security.[46] Furthermore, one-dimensional measures of employment status are problematic in low-income and middle-income settings, which commonly have high unemployment rates in the general population and a proliferation of so-called informal economies with complex resource-sharing networks and living conditions. These factors make the development of local culturally valid functional assessment tools, such as those developed by Bolton and colleagues,[31] particularly pertinent.
- Incorporate outcome measures of family or household economic status and burden. Both studies that assessed family economic status showed a positive effect.[32,35] A reduction in family and caregiver burden is an important outcome in settings in which most people with mental disorders are cared for at home by their families and when a reduction in family burden is associated with improved social functioning and clinical outcome for the patient, creating a virtuous circle.[44]

All studies should evaluate a broad range of interventions. Both reviews identified only a narrow range of interventions. In Review 1, although we searched for interventions related to debt relief and social insurance, we only found cash transfers, loans, and asset promotion interventions. In relation to Review 2, the individual placement and support model of supported employment has been shown in systematic reviews from high-income countries to be one of the most robust interventions for improvement of economic outcomes for people with severe mental illness,[48] and this is supported by studies in high-income non-western settings.[49] However, we found no studies from low-income and middle-income settings that evaluated the effect of such interventions.

There is a need not only for an increased number of randomised controlled trials with robust analyses, but also for studies with follow-up that is long enough to gain an understanding of long-term effects. Only two of the five randomised trials in Review 1 and one of the five randomised trials in Review 2 followed up participants after the initial postintervention assessment.[33] In Review 2, in particular, economic effects such as changes in employment status and earnings and getting out of debt, for the person with mental ill health or their family members, might take longer to manifest themselves. Although some studies followed up patients for up to 2 years,[32,35] this design was used because the intervention was complex and of long duration, and patients were assessed at the end of the intervention. Long-term postintervention follow-up of all treated patients is essential to establish whether effects on economic status are sustained.

alleviation interventions in very low resource settings remains largely unknown. There is therefore a pressing need for high-quality experimental studies from low-income and middle-income countries assessing the effect of poverty alleviation interventions on mental health status and the effect of mental health interventions on individual and family economic status. These studies should include several features, which are listed in panel 2.

The second priority is to assess the macroeconomic consequences of scaling up of mental health care in countries with low and middle incomes. The finding that mental health interventions can offer clear economic benefits at the microeconomic level of households strengthens the economic case for investment in mental health care. This outcome also raises a broader question: if provision of mental health treatment or rehabilitation programmes has economic benefits, what might be the costs and economic benefits of implementing such programmes at the macroeconomic or national level? The costs of scaling up a core package of mental health

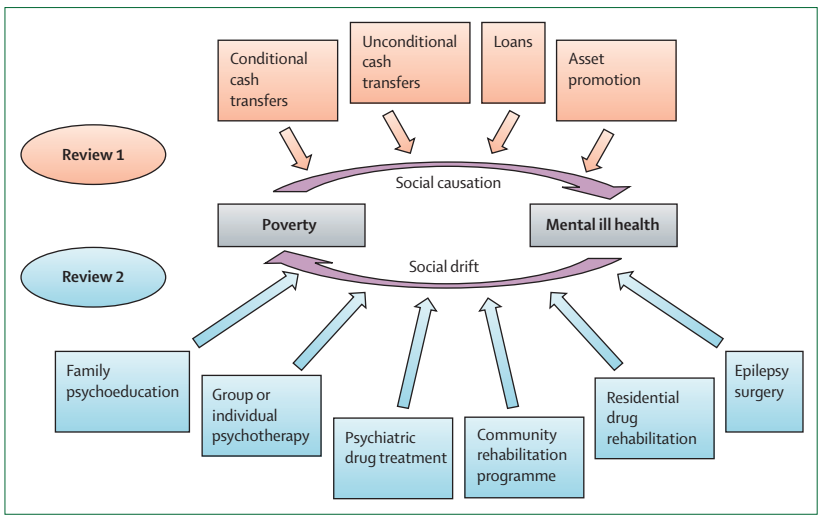

Figure 3: **Interventions identified in Review 1 (combating social causation) and Review 2 (preventing social drift)**

services have been set out in the previous *Lancet* Series on global mental health,[50] so there is already a basis for calculation of the direct health-care investments needed. However, estimation of the macroeconomic benefits or payoff associated with this investment needs further development, owing to well established deficiencies with prevailing approaches to the estimation of productivity gains or losses (such as the assumption that economies operate at full employment).[51]

One feasible alternative to the cost-of-illness method is an economic growth accounting approach or model,[52] which relates the contribution of labour, capital, and other factors to aggregate production levels in a country—ie, its gross domestic product (GDP). Ill health enters the model as a check on labour supply, and uses up resources (for health care) that could otherwise be saved or put to an alternative use. On the basis of this approach, the projected GDP that a country will achieve in the absence of a particular disease (ie, 0% prevalence) can be compared with the GDP that results from prevailing or target levels of prevalence reduction or disease control. Ultimately, the scope of such an assessment should go beyond GDP effects alone and also incorporate the intrinsic value of improved mental health status or psychological wellbeing. However, there are several methodological challenges to first address, including estimation of the effect of reducing health-related disability on labour supply or productivity, and the economic value to be accorded in different settings to a year spent in full health.

The third priority is to assess the effects of redistribution and market failures. State involvement in financing or providing mental health services is typically justified either by a desire to distribute or redistribute resources more fairly or to address so-called market failures that prevent achievement of socially efficient outcomes. Each is potentially a fruitful area for research in low-income and middle-income countries.

A policy maker with redistributive goals would compare the marginal benefits across the income range of interventions for mental health relative to interventions for other illnesses. Although infectious diseases such as tuberculosis and malaria might have higher relative incidence in the poor population, interventions for these illnesses might already be high enough that the health or welfare benefits of additional investment in treating these illnesses is lower than investment in mental health (for which prevalence is also unequally distributed across the income range, but existing levels of treatment are very low). Research that examines such comparative benefits in the poor population could yield evidence to support investment in mental health.

Few studies in low-income and middle-income countries specifically assess market failures in the mental health domain, but here too there are good reasons to invest in mental health research. First, many people with mental health problems lack insight into their condition, or fear stigma associated with careseeking; these characteristics lower demand for care below what is optimum for them, their families, and society, and lead to under-supply of services. The contribution of these characteristics to suboptimum demand for, access to, or uptake of mental health services has rarely been studied. Second, mental health problems are associated with substantial uncertainty and variability concerning symptom duration and severity, and hence uncertainty about personal economic effects, particularly for chronic conditions such as schizophrenia. Treatment effectiveness is also uncertain. These factors complicate the establishment of adequate insurance arrangements.[53] In countries with low and middle incomes, mental health is typically not covered under standard health insurance products, leading to substantial welfare losses when such illnesses strike. These welfare losses have been documented in the case of other illnesses[54] in these countries, but not for mental disorders.

Third, market failure can also stem from so-called externalities—the effect of poor mental health beyond the person with the illness. Unlike infectious diseases, in which contagion risks are well understood and studied, research into the effects of poor mental health in low-income and middle-income countries has typically been restricted to individuals with mental illness. Nevertheless, studies show[32,33,55] that individuals living with people with poor mental health are more likely to report worse mental health themselves. Poor mental health could have spillover effects, not only on the rest of the family, but also on society.[53] Documentation of the extent of such spillover effects would improve understanding of the wider benefits of mental health interventions.

Priorities for policy

These reviews have identified several interventions that can address the cycle of poverty and mental ill health in countries with low and middle incomes (figure 3). The preliminary findings from Review 2 suggest that although

the discipline is in its infancy, there is reasonably strong evidence that mental health interventions have economic benefits for individuals and families in low-income and middle-income countries, and have the potential to interrupt the cycle of poverty and mental ill health. The findings are important for strengthening of the economic case for investment in evidence-based mental health care. Our first recommendation therefore supports the call to scale up mental health services,[50] not only as a public health and human rights priority, but also, on the basis of evidence from this review, as a development priority.

By contrast with the findings for Review 2, the findings for the mental health benefits of poverty alleviation programmes in Review 1 are more equivocal. However, this outcome should not be interpreted as an indication that such programmes do not convey mental health benefits. There are individual studies that show that they do, particularly for conditional cash transfers, and the findings of this review point to the need for more precise assessments of the effect of particular components of such programmes. The second recommendation is therefore that mental health should become integrated as a central element of monitoring of the outcomes of poverty alleviation programmes. When combined with longitudinal data, evidence from household surveys (rather than individual patients alone) could yield valuable insights both into the ability of households to insure against mental disorders and the wider effects of such disorders on the family. Integration of such household surveys with randomised controlled trials that intervene either in the mental health or in the poverty domain can provide causal evidence for the broader temporal and spatial links between mental health and poverty. Available evidence suggests that poverty alleviation programmes can have mixed effects on mental health, and further research is needed to provide a more conclusive picture.

Conclusion

In the same manner that the first *Lancet* Series on global mental health in 2007 drew attention to the need to address global mental health as a neglected public health priority, this study draws attention to the need to address mental health as a neglected priority in international development economics. The findings of the systematic reviews that we have undertaken suggest that breaking of the cycle of poverty and mental ill health in countries with low and middle incomes is possible in specific settings and for specific interventions. Currently, the evidence for interventions that address the social selection or social drift pathway, by providing treatment and rehabilitation interventions for people with mental illness, seems to be the most robust. This finding does not preclude the possibility that poverty alleviation interventions convey mental health benefits for populations by addressing the social causation pathway. However, the evidence for poverty alleviation interventions is less strong, and there is an urgent need for further research, particularly to include methodologically sound mental health outcomes in evaluations of poverty alleviation interventions.

Some of the differences in the findings between Review 1 and Review 2 can be accounted for by the more targeted nature of the interventions in Review 2, which largely focused on a specific disorder or group of disorders, within an identified age range. In this context, the evidence for interventions that address the social selection or social drift pathway by providing treatment and rehabilitation interventions for people with mental illness supports the call to scale up mental health services.[12,50] This is not only a public health and human rights priority, it is also a development priority.

Contributors

CL wrote the first draft of the introduction, CL and SP wrote the first draft of the review on combating social causation, MDS and SC wrote the first draft of the review on social drift, CL, MDS and SP wrote the first draft of the discussion, and DC, MK, JD, CL and MDS wrote various parts of the section on priorities for future research. CL wrote the first draft of the conclusion. The literature searches and analyses of studies were undertaken by CL, MDS, SP and SC, and the data extraction was done by SC and SP. VP provided intellectual oversight for the design and analysis, and all authors contributed to the revision of drafts.

Conflicts of interest

We declare that we have no conflicts of interest.

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