

## Universal Health Coverage 1



# Does progress towards universal health coverage improve population health?

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Many commentators, including WHO, have advocated progress towards universal health coverage on the grounds that it leads to improvements in population health. In this report we review the most robust cross-country empirical evidence on the links between expansions in coverage and population health outcomes, with a focus on the health effects of extended risk pooling and prepayment as key indicators of progress towards universal coverage across health systems. The evidence suggests that broader health coverage generally leads to better access to necessary care and improved population health, particularly for poor people. However, the available evidence base is limited by data and methodological constraints, and further research is needed to understand better the ways in which the effectiveness of extended health coverage can be maximised, including the effects of factors such as the quality of institutions and governance.

### Introduction

WHO and many other commentators have called for countries to take concrete steps towards the achievement of universal health coverage, which in its simplest formulation means providing all people with access to needed health services of sufficient quality to be effective, without their use imposing financial hardship.<sup>1-3</sup> Stronger reliance on prepaid health spending and risk pooling mechanisms are regarded as key indicators of progress towards universal coverage (panel). One fundamental objective is to reduce the financial barriers that people face to gain access to necessary health care. High reliance on out-of-pocket payments in health

financing is associated with an increased risk of households being affected by financial catastrophe, being pushed into poverty (or further into poverty) because of health-care payments, or forgoing needed treatment because of inability to pay.<sup>1,5,6</sup>

Even though financial protection is in itself regarded as a valuable objective in many societies, expanded coverage is also justified on the grounds that it leads to health improvements, particularly for poor people.<sup>1,7</sup> This reasoning often lies behind efforts to expand access to health services through pooled prepayment mechanisms that have an insurance function. The logic is that such pooling mechanisms will increase access to care by

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This is the first in a [Series](#) of three papers about universal health coverage

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### Key messages

- A greater reliance on prepaid health spending and financial risk pooling is regarded as a key sign of progress towards universal health coverage
- The direction and strength of the links between pooled prepayment, insurance mechanisms, and population outcomes can be affected by many factors
- State-of-the-art quantitative methods provide evidence on the causal effect of broader health coverage on population outcomes
- Broader health coverage generally leads to better access to necessary care and improved population health, with the largest gains accruing to poorer people
- The health gains derived from broader coverage are likely to depend on factors such as institutional framework and governance arrangements
- Countries with enough resources should regard progress towards universal health coverage as a key investment target
- Donors have an important role in ensuring that the poorest countries have the sustained ability to invest adequate resources in the enhancement of coverage

### Search strategy and selection criteria

We searched for studies that examined the population health effects of extended pooled prepaid health expenditure and insurance mechanisms as proxies for progress towards universal health coverage, and focused on quantitative evidence based on data from the broader national and cross-country levels. We searched the JSTOR, Google Scholar, Ideas-RePEc, and PubMed bibliographic databases, with combinations of the terms "health", "spending", "expenditure", "insurance", "coverage", and "outcomes". We selected (preferably peer-reviewed) articles from economics, social sciences, health services, and medical journals, and relevant books and working paper series. We excluded studies that described simple associations between pooled spending, insurance interventions, and health outcomes. Since studies based on randomised controlled trials of interventions at the health-system level are rare (appendix), we searched for non-experimental studies that examined the relations of interest and attempted to deal with potential estimation biases, which arise from both observable and unobservable differences between people or countries, through use of appropriate impact evaluation techniques.

See Online for appendix

**Panel: Health financing**

The resources raised to fund health systems can come from various domestic and external sources. Most countries seek to collect and manage such funds through risk-pooling mechanisms, so that the costs of illness for an individual do not need to be met by that person alone. Instead, these often unpredictable costs are shared across members of a large group of individuals through their contributions to the risk-pooling scheme. Financial contributions to the pool are usually accumulated from various sources of prepayment, including general and payroll taxes. By spreading the financial risk of health care across its members, pooling schemes—such as national or private health insurance arrangements—reduce the likelihood of ill people facing financial hardship because of health payments, or even failing to gain access to appropriate care because of inability to pay.<sup>4</sup>

Therefore, countries that rely more heavily on out-of-pocket payments to finance their health systems, rather than pooled prepaid funds, tend to be in a worse position to protect their citizens from the financial risks of illness. Out-of-pocket spending takes place at the time of illness, and usually refers to direct fees paid by individuals to service providers such as doctors, hospitals, pharmacies, and laboratories. Such payments include formal and informal charges paid to seek and obtain care. Out-of-pocket payments can occur even if a person has insurance coverage because of restricted benefits packages, and because insurance plans often require some degree of cost sharing by beneficiaries. This cost sharing takes the form of deductibles (money that has to be paid by the beneficiary before the insurance plan covers any other expenses), co-insurance, and copayments (the proportion or fixed amount, respectively, of the total medical costs that has to be borne by the beneficiary).

Insurance arrangements represent an important policy choice for governments, as the system of individual financial contributions to the insurances pool determines the magnitude of implicit transfers from rich people to poor people and from those who are healthy to those who are sick.

enhancing the availability and affordability of needed services, and thereby improve health.<sup>8</sup>

The figure illustrates the underlying argument by showing, in a simplified way, the potential causal chain from pooled prepayment (publicly or privately funded) to coverage (effective access to care and financial protection) to health outcomes. There can also be reverse causality in the chain if changes in population health status trigger changes in the amount of pooled funds available for health.

Although the causal pathway from pooled prepayment to universal coverage and health is often taken for granted in the international debate, findings from empirical research have not always shown that population

health systematically improves in response to enhanced risk pooling and prepayment. There are theoretical reasons why those links might be weak or non-existent at the population level, since the relations in question could be affected by many other elements, represented by the vertical arrows in the figure. For example, a rise in government health spending—which usually takes the form of prepaid funds and amounted to 60% (IQR 45·4–75·6) of total health spending across 192 countries in 2008<sup>9</sup>—might be accompanied by a matching reduction in prepaid private health expenditures. This situation could result in no changes in total prepaid spending, service use, or health status.

Even if extra government spending does increase the total amount of pooled resources devoted to health care, its effect on health might be disappointing if the targeting of funds is poorly aligned with population needs.<sup>10</sup> Furthermore, the magnitude of any health gains is likely to depend on the identity of the beneficiaries. Poor people will usually stand to gain most from increased access to health services, so if access improves only for small groups of richer people, there could be few observable gains in aggregate.

Robust quantitative evidence is necessary to substantiate that the predicted causal pathway does occur in practice for populations, and to identify the main system-wide factors affecting the strength of the relation. Our aim is to synthesise the most rigorous, relevant empirical evidence produced so far, with a focus on system-level and cross-country statistical research.

**Does pooled health spending improve population health?**

National progress towards universal health coverage is intertwined with steps in the direction of a so-called health financing transition, characterised by rising per-head health spending and an increasing use of pooled health funding.<sup>11,12</sup> This trend has been accompanied by overall improvements in health status indicated, for example, by rising life expectancy and downward trends in child mortality rates.<sup>9,13</sup> The empirical challenge is to assess the extent to which these observed relations are causal.

Much of the early research focused solely on identification of simple correlations in cross-country data between pooled prepaid health expenditures (usually publicly funded) and population outcomes, without addressing the issue of causality. For example, with simple regression analysis on data from 18 high-income countries, Cochrane and colleagues<sup>14</sup> examined the correlation between mortality rates and health service inputs such as total health spending (not only prepaid) as a share of national product, but did not identify a significant association. Thereafter, investigators of most of the early cross-country studies generally reported weak evidence of a health spending effect on mortality indicators, whereas socioeconomic factors—especially

income—often proved to be highly associated with health outcomes.<sup>15–17</sup> The same is true of Filmer and Pritchett's study,<sup>18</sup> in which the investigators noted statistically insignificant public spending effects on mortality in infants and children younger than 5 years, with point estimates suggesting that government expenditures account for less than a seventh of a percentage point of mortality differences between countries.

More recently, researchers have examined longitudinal datasets using more robust empirical methods to assess causality from pooled health spending to population outcomes. Many of these studies have focused on government health expenditure and child mortality, showing evidence of higher public spending causally leading to better mortality outcomes. For example, Wagstaff and Claeson,<sup>10</sup> who examined data for 120 countries, generally noted significant beneficial effects of increased government health spending (as share of domestic product) on maternal mortality and mortality in children younger than 5 years. For child mortality, the researchers estimated reductions of 0·8–1·5% for a 10% higher share of government health expenditure. Bokhari and colleagues<sup>19</sup> used instrumental variable regressions on a sample of 127 countries to estimate that a 10% increase in government health expenditure per head leads to reductions of 2·5–4·2% in mortality for children younger than 5 years and 4·2–5·2% in maternal mortality rates. Empirical evidence from country case studies in high-income and middle-income settings suggests similar findings.<sup>20,21</sup>

We have previously used instrumental variables on longitudinal data for 153 countries to identify causal links between pooled prepaid health expenditures (public and private) and population outcomes.<sup>22</sup> We estimated average reductions of 7·9 (95% CI 1·4–14·4) deaths per 1000 children younger than 5 years and 1·3 (0·2–2·5) adult deaths per 1000, in response to a 10% increase in government health spending per head, but no effects from higher private insurance expenditures. Although additional health expenditure is linked to decreased adult mortality even if such spending is out-of-pocket, a higher share of out-of-pocket payments in national health financing has a detrimental effect on adult health—eg, an extra 11·6 (1·1–22·2) female deaths per 1000 in response to a 10% higher out-of-pocket share. This finding implies that countries should obtain larger health benefits if any extra health funds are channelled through pooled prepaid sources instead of out-of-pocket, and citizens are better financially protected against illness.

Cross-country research suggests that health improvements from increased pooled spending can vary across countries and population groups. For example, poor people in poorer countries seem to benefit the most from additional government health expenditures.<sup>23,24</sup> Since comparable cross-country data for variations in health status by income groups are scarce, these studies

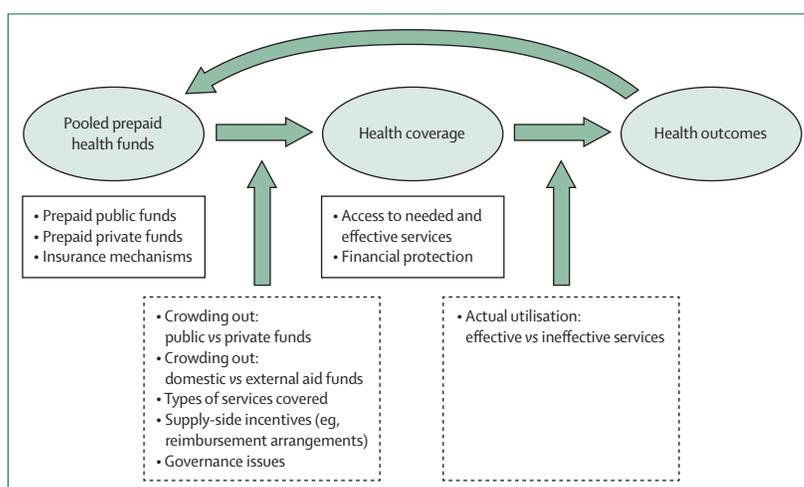


Figure: Causal pathway between pooled prepaid health financing, health coverage, and outcomes

use complex regression models and indicators such as the two-dollar-a-day poverty line to estimate the distribution of health outcomes between poor and non-poor groups in each country. This work offers support for the idea that poorer people rely more on government spending for staying healthy than do better-off citizens, who can more readily substitute private for public health spending.

In many cases, foreign resources have proven crucial to fill gaps in the domestic availability of health financing. External funds reach between 55% and 65% of national health spending in countries such as Tanzania, Malawi, and Mozambique (2008 data).<sup>9</sup> Theoretically, health aid can lead to improved population outcomes by enlarging the pool of prepaid health funds, and improving coverage and service delivery. However, aid might not have these effects if the additional external funds lead governments to decrease domestic resources allocated to the health sector, or if weak governance means that aid is not spent effectively on health needs (figure).

The population effects of foreign health aid in poorer countries have rarely been assessed. An investigation<sup>25</sup> using cross-country longitudinal data has shown that increased health aid generally leads to improved health, as measured by reduced mortality rates in infants and children younger than 5 years. The results suggest an average 2% (95% CI 0·5–3·6) reduction in infant mortality rates for a doubling of health aid per head. A positive correlation between health aid and national health expenditure has also been identified, suggesting that aid can stimulate use of domestic resources in the health sector (which then tend to be effectively used to promote access to services and health). However, with more disaggregated data, Lu and colleagues<sup>26</sup> noted that health aid to governments tends to reduce domestic government health expenditures, whereas aid targeted at the non-governmental sector is associated with a rise in domestic public spending on health.

### Do insurance mechanisms improve population health?

A growing number of researchers have examined the relation between population outcomes and broader coverage through publicly and privately funded schemes that have an insurance function. The evidence is almost exclusively from individual country studies rather than from a comparative international perspective. One conclusion that emerges from this work is that expanded insurance mechanisms generally lead to improved coverage (access to care and financial protection) and improved health outcomes, although the magnitude of the estimated gains varies greatly dependent on context.

For high-income countries, most studies have identified sizeable improvements in access to care and financial risk protection resulting from insurance coverage—eg, in the USA, where the implementation and expansion of the Medicare and Medicaid schemes have been linked to increased use of preventive, outpatient, and inpatient services, and reduced financial hardship caused by health payments.<sup>27–29</sup> Several studies have investigated these issues in other high-income countries, with similar results.<sup>30,31</sup>

For middle-income and low-income countries, most analyses from the past decade have shown that coverage expansions for outpatient and inpatient services, through publicly or privately funded insurance mechanisms, raise service use. For example, the introduction of a broad, heavily subsidised health insurance programme in China, the New Cooperative Medical Scheme, has led to substantially increased use rates of preventive, outpatient, and inpatient services.<sup>32,33</sup> Similarly, the Thai 30 Baht programme introduced in 2001 (now renamed Universal Coverage scheme) increased inpatient care use by poor people by between 8% and 12% from 2001 to 2005.<sup>34</sup>

The additional service use stimulated by insurance expansions has not generally resulted in a heavier burden of health-care payments for households, with some interventions clearly reducing the incidence of catastrophic and impoverishing health payments.<sup>35,36</sup> One example is the introduction of the *Seguro Popular* scheme in Mexico, which reduced the incidence of catastrophic health payments by 1.9 percentage points (95% CI 0.2–3.7) after 10 months.<sup>37</sup>

Investigators of most studies in high-income countries have noted that, through enhanced service access and financial protection, insurance mechanisms result in improved health status for previously uninsured population groups.<sup>27–31</sup> In middle-income and low-income settings, much of the relevant research also shows health improvements accruing to formerly uninsured groups<sup>35</sup>—eg, the implementation of the Thai scheme has resulted in an estimated decrease of 6.5 (95% CI 1.9–11.0) infant deaths per 1000 births in poor people.<sup>34</sup> Furthermore, an empirical analysis of Brazilian survey data has linked uptake of supplemental private health insurance to improvements in access to care and

self-reported health status of respondents with acute health problems.<sup>38</sup>

Nevertheless, investigators of other studies have not recorded evidence of causal links between expanded health insurance mechanisms and population outcomes. Such studies often do not identify systematic insurance effects on service use or financial protection, which might at least partly account for the absence of health effects. For example, the Chinese New Cooperative Medical Scheme does not seem to have reduced the overall burden of out-of-pocket health payments or improved self-assessed health.<sup>32,33</sup> No effect on self-reported health indicators is also the conclusion from the short-term assessment of *Seguro Popular* in Mexico, which despite its financial protection benefits did not change general patterns of service use (although the scheme has improved access to obstetric services, and longer-term descriptive analyses suggest increased probabilities of service use by insured individuals).<sup>37,39,40</sup>

Thus, rather than suggesting unequivocal health gains from extended insurance mechanisms, the evidence emphasises the crucial part played by the specific institutional characteristics of the system under scrutiny and the subpopulations examined.

### Evidence and policy implications

A key objective of moving towards universal coverage is to improve population health through the reduction of financial barriers to needed services. We have summarised the most rigorous evidence on the causal pathway from a methodological viewpoint, and believe that overall it offers important insights.

The reviewed work supports the idea that expansions in coverage measured by higher levels of pooled health spending normally lead to better population outcomes. However, the magnitude of the estimated spending effects varies between studies, depending on factors such as the specific health indicators and expenditure categories analysed. Moreover, the effectiveness of additional pooled spending often depends on the quality of governance and institutions. In countries with good governance (higher degree of public sector accountability, less corruption, etc), the beneficial effects of government health spending on child and maternal outcomes are larger than in poorly governed countries.<sup>10,41,42</sup> The implication is that in countries with poor governance and weak institutions, progress towards universal health coverage must be accompanied by improvements in areas such as public sector administration and provider accountability.

In the context of global economic crisis, increasing health-care demands, and continuous technological innovation, health budgets are coming under acute pressure, particularly in low-income countries, where there is already constrained spending capacity. Yet the reviewed evidence advises against the abandonment of progress towards universal coverage in the form of reduced publicly pooled health financing. There is a

scarcity of robust evidence on the health effects of better financial protection as measured by incidence of catastrophic or impoverishing health expenditure. However, as well as exposing citizens to increased financial uncertainty, the evidence suggests that a retreat from progress towards universal coverage will generally have an adverse effect on people's health and, hence, broader welfare.<sup>43–46</sup> Although some private out-of-pocket payments will likely always remain in the health system, some evidence suggests that financial risk protection and the population benefits from a specific level of health resources tend to be larger when countries rely less on out-of-pocket financing.

The pursuit of a fairer distribution of access to care and health outcomes is a fundamental objective of many health systems.<sup>1</sup> The evidence suggests that the health gains from expanded pooled health financing and access to services tend to be larger in poorer countries than in richer ones, and in the poorest population subgroups within countries. This tendency emphasises the potential equity benefits of progress towards universal health coverage and the importance of adequate targeting of public health expenditures at vulnerable groups. Public spending in health has historically favoured the rich in middle-income and low-income countries, partly because of policy choices (such as widespread user charges in government health facilities) that supported the capture of publicly funded services by those who are better off.<sup>47</sup> However, targeting has improved since the 1990s through mechanisms such as more widespread use of subsidy interventions for specific populations, wider availability of public health facilities and information about social programmes, reduced reliance on user fees, and better governance.<sup>48–50</sup> This improvement could be one of the reasons for the stronger public spending effects on population outcomes uncovered by recent cross-country studies, compared with those done before the 2000s.

The intention of making health care more affordable is to induce a greater use of appropriate services. In principle, enhanced access to care could be achieved through expansions in either publicly or privately pooled financing. However, evidence for the causal relation between privately pooled resources and outcomes is scarce, especially from international data. In practice, in view of the generally limited ability to pay privately for insurance fees in low-income settings, a substantial proportion of poorer citizens will always need to be covered from the government budget. Private prepaid plans represented only 3% (IQR 0·0–3·8) of total health spending on average in low-income and middle-income countries in 2008.<sup>9</sup> Publicly funded pooling mechanisms are therefore likely to remain essential policy levers for progress towards universal coverage.

One concern with any insurance mechanisms is that they might induce consumption of unnecessary health services. Yet the much larger issue in poorer countries arises from the severe problems of underuse of needed

services, and much of the reviewed evidence suggests that expanded insurance schemes in such contexts will translate into greater use of necessary care, and health and welfare gains.<sup>35,51</sup> It is nonetheless important that improved governance arrangements run alongside such expansions to ensure increased use is targeted at appropriate interventions.

Researchers in this domain have had to work with very scarce data, constrained by short duration of time series, and often relying only on mortality outcomes as indicators of population health.<sup>35,37</sup> There is particularly insufficient evidence for the link between incremental pooled health spending and aggregate morbidity patterns, since there are few comparable cross-country time series of reasonable duration on the incidence of chronic and non-chronic diseases. Although they are useful for some policy analyses, synthetic estimations such as burden of disease research are of little value for inferential statistical purposes.

The weak health effects of pooled spending detected by investigators in a few studies might to some extent arise from data and methodological limitations (appendix). The magnitude of health gains from extended coverage is often dependent on context, and researchers have rarely had sufficient data to investigate the effects of specific institutional factors, such as the actual availability and location of providers, and the net effect of existing provider payment incentives on coverage and health outcomes.<sup>52</sup> Much empirical research has struggled to control adequately for potential reverse causality and other confounding factors that might weaken the link between health outcomes, pooled spending, and insurance interventions. Fortunately, better data and advances in econometric methods are enabling researchers to overcome some of these analytical barriers.

Increased health sector funding might not be an immediate option in some national contexts, making efficiency gains in the health system a key instrument to augment the availability of pooled funds to expand coverage, and hence improve population health.<sup>1</sup> Further research into how system efficiency is affected by factors such as alternative revenue collection and purchasing mechanisms is thus warranted. Since in the foreseeable future many poor countries are likely to struggle to expand pooled health financing from domestic sources even after reducing inefficiencies, the evidence emphasises the importance of donor support to supplement domestic spending capacity. Evidence from the scarce cross-country research available suggests that incremental donor resources for health generally trigger population health gains, supporting calls for the scaling up of aid to improve human capital in low-income countries.<sup>53</sup> A key unresolved issue is what form of health aid is the most effective. Is it best channelled through governmental or non-governmental budgets, and through horizontal or vertical programmes? Again, the quality of institutions and governance will be major considerations.

Notwithstanding these many caveats, there is a growing amount of work supporting the view that a country's progress towards universal coverage leads to better health, especially for poor people. However, success depends crucially on the details of implementation, such as good governance, maintenance of quality standards, careful choice of benefits package, and targeting populations who are especially vulnerable. Much research is needed to understand the ways in which the effectiveness of coverage can be maximised. Subject to these qualifications, we nevertheless believe that policy makers can be secure in the knowledge that, if carefully implemented, steps towards universal coverage represent an important strategy to improve the health of their populations.

#### Contributors

Both RM-S and PCS contributed to the conceptualisation and writing of the report. RM-S did the initial searches and wrote the first draft. All subsequent drafts were written by RM-S and PCS. Both authors approved the final version.

#### Conflicts of interest

We declare that we have no conflicts of interest.

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