

WHITEPAPER

From Take-up to Impact: Evidence and Research Gaps on Inclusive Insurance

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This paper was developed as part of an innovative collaboration between AXA EssentiALL, AXA's inclusive insurance business unit, and J-PAL that began in 2025. This unique research collaboration brings together rigorous academic leadership and deep practitioner experience with a joint aim to 1) build on the growing global knowledge around inclusive insurance policy, adoption, and social impact, based on available scientific evidence, and 2) generate rigorous and independent insights that can galvanize multisector engagement to advance the global inclusive insurance agenda. This Whitepaper synthesizes existing research to assess what is known about impact and identify key gaps, leading the way to generate practical, policy-relevant evidence to inform how inclusive insurance can better support financial resilience among low-income populations.

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INTRODUCTION

In low- and middle-income countries (LMICs), 44 percent¹ of adults would be unable to cover an unanticipated expense without difficulty. Most of the potential risks faced by individuals could be covered by formal insurance, and many are too large or spatially correlated for individuals or communities to efficiently manage alone (Heltberg et al., 2014). However, only 23 percent of these adults pay for any type of insurance policy (11 percent not including China). *What does the academic evidence say about the impact of insurance on low- and middle-income populations in all countries? Where is research lacking, and how can we fill these gaps?*

Insurance is a risk transfer tool by which, in exchange for a premium, an entity offers a payout in case of verifiable risk realization (e.g., illness, death, natural disaster). It can complement or substitute informal insurance delivered through one's network and other risk management strategies (like preventive measures, savings or social safety nets, or informal coping strategies post-shock), and it can be socially or privately distributed. As shown below, insurance products are unevenly distributed across risks, as is the economic academic evidence about them.

Insurance Type	US Revenue (in \$billion)	US Coverage	Developing Country Revenue (in \$million)	Developing Country Coverage	Evidence on Adoption	Evidence on Impact
Agriculture	17.3	90%	3722.73	1.42%	****	**
Health	1104.5	92%	92.84	0.51%	****	***
Auto	349.93	84.60%	48.44	0.02%	.	.
Life	213.9	51%	1739.87	6.79%	.	.
Property/Natural Disasters	162.28	92.60%	89.67	0.20%	***	***

Sources: Micro-insurance network (2024), US Census (2025), LIMRA, NAIC, USDA, Insurance Research Council.

Columns 5 and 6: number of papers on the subject in the review. . = <5, *=5-9, **=10-14, ***=15-19; **** = >20. US Revenue and US coverage designate respectively revenues from insurers in the US and the percentage of potential customers covered by insurance policies.

Table 1 — Insurance and evidence base distribution across risk and countries

Importantly, insurance products are comprised of both the coverage—what is covered, at what premium, and with which deductibles and exclusions—but also the distribution, customer education, enrollment and claim processes, and environment in which services are offered (e.g., healthcare and drug supply for health insurance). Demand for an insurance product encompasses both the perceived value of the insurance itself and of these complementary features, complicating efforts to measure the impact of insurance. Low demand can impede researchers from observing any outcome other than take up, as is shown by the overrepresentation of adoption in the literature from columns 5-6 in Table 1.

¹ Findex (2025).

Inclusive insurance encompasses all insurance products designed for populations typically excluded from traditional insurance markets in LMICs and elsewhere. In this paper, we follow the definition from the Landscape of Micro-Insurance as “*Products with modest premium levels based on the risks insured and which are developed specifically to serve the needs of the low-income population*” which encompasses simplified exclusion conditions, streamlined enrollment processes, or other efforts to lift financial and non-financial barriers to insurance acquisition. In this review, we include papers documenting insurance products in LMICs, where we highlight any important deviation from the inclusive insurance definition above, and products specifically targeted toward vulnerable segments in high-income countries (HICs).

Low- and middle-income households are the most likely to be uninsured and are typically the first to bear the impact of risk. Only 17 percent of adults in developing economies report ever having personally paid for health insurance (Demirguc-Kunt and Klapper 2012). This is a lower bound for risk exposure when factoring in underinsurance: For example, 90 percent of natural disaster losses are uninsured. When risk materializes into income or expense shocks, low-income households, including those in higher-income countries, are more likely to rely on costly coping strategies,² often depleting savings, selling productive assets, or reducing essential consumption.³

As climate change is likely to increase the frequency and severity of some of the costliest insurable risks, the need to generate evidence on risk mitigation tools becomes more urgent. However, micro-insurance has received less attention than other financial inclusion initiatives, such as microcredit, digital payments, or cash transfer programs. What we know about inclusive insurance is also mismatched with the composition of insurers’ portfolios or households’ diversification strategies in developing countries (see Table 1).

The collaboration between J-PAL and AXA EssentiALL—AXA’s inclusive insurance business—on inclusive insurance is motivated by patterns of growing and unequal exposure to risk, along with insufficient knowledge of the impact of inclusive insurance as a policy tool for development in the face of uncertainty. The mission of the collaboration is to promote the provision of welfare-enhancing insurance for billions of under-served individuals around the world, by helping build new research that seeks to generate rigorous empirical evidence on understudied risks, settings, populations, or outcomes.

This includes:

1. Answering novel questions on well-documented risks and exploring underrepresented ones
2. Improving our understanding of the performance of insurance relative to other risk management tools, and of insurance products across risks
3. Implementing and testing innovative product designs, delivery modes, and so on, and documenting their targeting and impact on vulnerable populations, preferably in the long-term and with scalable products.

This paper aims to assess the current state of academic evidence on the impact of micro-insurance, identify gaps in existing research, and highlight avenues for future research. We hope that academics can

² Ibid.

³ Ibid.

positively and creatively interact with insurers, working together to design, test, and scale new types of insurance and new delivery methods.

We organize our review by risk. For each risk, we attempt to address the outcomes on different customer segments. In each section, we evaluate the enrollment effectiveness of different types of interventions before exploring their impact. Section 1 covers health insurance, Section 2 examines agricultural risk, Section 3 focuses on death and funeral insurance, Section 4 addresses natural disaster risk, and Section 5 discusses overall conclusions on the impact of micro-insurance and future research avenues. When the volume of evidence allows, we address each population segment separately within a section. We first examine the drivers of take-up before exploring the impacts of insurance products once they are adopted. Note that, while aligned with J-PAL's mission of primarily focusing on evidence from randomized evaluations, we also include non-experimental research. To help guide future applications, we end each section with key empirical questions for experimental research. We conclude with a set of pressing themes and questions for insurance in general.

HEALTH

Health shocks are one of the most universally distributed shocks, hitting rural and urban households at all levels of development. However, coping mechanisms in the absence of insurance are costlier for poor households in low- and middle-income countries, making them more likely to have to cut consumption or sell productive assets to pay for care (Heltberg et al., 2014).

This situation highlights the potential benefits of health insurance for economic growth and poverty alleviation. However, there are major challenges in implementing health insurance policies for vulnerable customers, first among which is insurance delivery in LMICs. When state enforcement capacity is limited, adverse selection can destabilize a compulsory health insurance system: The healthiest individuals, whose participation reduces average costs and premiums for others, are the most likely to exploit weak enforcement and opt out (Banerjee et al., 2021). Prevalent informality, especially among the most vulnerable, complicates the delivery of state-delivered workplace health insurance.

In this section, we focus on two questions: Who enrolls in health insurance, and how can enrollment be increased, especially among healthier people? When insurance is taken up, what are its population-dependent effects in terms of financial resilience, healthcare utilization, and actual health outcomes?

Health-related risk is complex and multidimensional, leading to great variety in health insurance products distributed under this generic terminology. First, health events impact household finances in multiple ways beyond healthcare expenses. For example, in the US, Dobkin et al. (2018) estimate income loss to represent around 20 percent of the financial effect of a health shock in the first year after health events occur. Second, covering health risk engages many actors, including healthcare providers, pharmacists, and insurers, which multiplies the risk of misaligned incentives or quality issues in service delivery along the value chain. Health risk complexity affects supply and demand in ways that highlight the need to look below the “health insurance umbrella” into contract design, delivery mechanisms, and partner-specific details to better understand products and their impact. When research has found mixed results, we can use the differences in product and delivery characteristics to better understand these variations in impact.

TAKE-UP

Health insurance coverage is low and uneven in LMICs. Analyzing cross-country data from 56 LMICs, Chen et. al. (2022) find that only 1 out of 5 adults declares benefiting from health insurance—75 percent of which is public. This figure hides substantial heterogeneity, with enrollment rates below 10 percent in 38 countries. Barriers to enrollment in health insurance, such as financial constraints, complexity, inattention, and other behavioral biases are often amplified in contexts with limited infrastructure or among particularly vulnerable populations. As a result, inequalities in access to insurance are especially steep in sub-Saharan African countries (ibid.). Even in higher-income countries where insurance is mandatory, liquidity constraints can impede enrollment among low-income groups, including individuals who are sick, unemployed (Fung et al., 2023), or migrants (Rivera-González et al., 2021).

Insurance take-up is crucial to realize beneficial protection, as well as to evaluate the impact of insurance interventions, and is often important for insurance markets to function well. This section will explore the

average and differential impacts of interventions designed to reduce liquidity constraints, complexity, and behavioral biases across different levels of development and various customer segments.

Price experiments

Subsidy experiments have usually yielded higher take-up, suggesting that consumers are price-sensitive and that lowering prices can have the added benefit of attracting healthier individuals to the risk pool. In Banerjee et al. (2021), those who take up insurance even with no subsidies are 10 percentage points more likely to have a chronic disease at the time of enrollment. Increasing co-payments for workplace health insurance in China led to the poorest and healthiest individuals dropping out first (Huang et al., 2017). Research in urban Indonesia (Banerjee et al., 2021) and rural Ghana (Asuming et al., 2024) shows that subsidies significantly increase enrollment, with lasting effects even after subsidies end, indicating an experience effect. In the former study, full subsidies with a time limit for enrollment increase take-up by 28 percentage points and enrollment remains twice as high for the treated after subsidies end. In the latter, enrollment is 18 percent higher even three years after the end of the subsidy. This is not automatic, however. Some subsidy experiments yield very low retention rates—under 10 percent renew their insurance policy after the subsidy ends for health insurance for informal workers in Nicaragua (Thornton et al., 2010)—a potential explanation being high monthly premiums (US\$15), highlighting the challenges associated with providing affordable voluntary insurance. Moreover, in some rural areas, price and liquidity constraints are not the sole barrier: Studies in the Philippines (Capuno et al., 2016) and Burkina Faso (Hillebrecht et al., 2021) found that subsidies only improved enrollment in urban settings, suggesting additional barriers like remoteness or complexity.

Group-level enrollment: Microlending grew tremendously by using a group lending approach, which reduced transaction costs and facilitated risk-sharing and monitoring. Similar approaches could work in health insurance, with models that enroll households, communities, or other peer groups together. When enforcement capacity is low, group insuring could ensure healthy individuals remain in the system and increase its sustainability. However, the appropriate level for such groups remains to be found and tested in most contexts where insurance is voluntary. Fischer et al. (2023) test such an intervention in Pakistan, finding that enrolling insurance at the household or community level, rather than individually, increased the overall health of the pool and decreased the average premium. Average equilibrium prices are estimated to be 25 percent cheaper under household or community than under individual enrollment in that setting.

Experiments on product accessibility: remoteness, complexity, and payment flexibility

Interventions that simplify the enrollment process can help overcome non-financial barriers that subsidies alone cannot address. Evidence from both HICs and LMICs suggests that complexity-related barriers to insurance enrollment are widespread, and that interventions that simplify enrollment can increase take-up.

Remoteness and complexity: In urban Indonesia, assistance with online registration improved enrollment rates, although administrative issues posed challenges (Banerjee et al., 2021). A handholding intervention in the Philippines (Capuno et al., 2016) offering to deliver enrollment letters directly to offices increased enrollment by 29 percentage points with effects concentrated in rural areas where enrollment barriers were greater. Increased process complexity also led to the exclusion of poorer, younger, and healthier

individuals for whom insurance has lower value but is cheaper to provide. This is illustrated by Shepard et al. (2025), who study a change in the default option from insured to uninsured in Massachusetts and find that, in terms of introducing healthier individuals in the pool and lowering premiums, an auto-enrollment policy has the same effects as a US\$40 subsidy.

Payment flexibility: Accessibility can be a problem for many populations beyond just rural areas, as exemplified by positive effects on take-up among the urban elderly due to increased flexibility in payment methods in China (Lei et al., 2025). Other payment-related challenges remain unresolved: In less formal markets, it is still challenging to enforce yearly payments or registration windows that discourage strategic exit and entry. Finding innovative ways around these impediments could make insurance cheaper and increase the resilience of the healthcare system.

In markets where insurance is non-compulsory, or where enforcement is weak, *adverse selection* is a significant problem that can discourage the supply of insurance, making it even more expensive. In Banerjee et al. (2021), households who subscribe to insurance even without a subsidy are 14 percentage points more likely to have a claim than households who subscribe under a full subsidy (from a base of 48 percent), and they are more likely to submit a big claim in the coming weeks and to exit soon after. For such markets, product design interventions are promising: Fischer et al. (2023) document that bundling policies at the household or community level in Pakistan encourages the inclusion of healthier members. Policies addressing adverse selection by making products less comprehensive or encouraging self-selection have generally been unsuccessful, as low enrollment is likely also caused by products being unattractive—especially to healthier individuals—rather than purely to sicker individuals enrolling more (Banerjee et al., 2014; Shepard et al., 2025). There is high potential for interventions encouraging service and/or product quality rather than focusing on targeting.

Experiments to address behavioral biases

Many behavioral biases can reduce health insurance take-up. Even in HICs, many individuals struggle to determine if they are already insured, as seen in California's Individual Marketplace Plan (Chen et al., 2022). Insurance being compulsory does not prevent half of households from making non-profit-maximizing choices given their health risk, as Handel et al. (2024) show in the Netherlands. Default options significantly influence enrollment; changing the default to “uninsured” leads many to drop out, particularly those for whom decision-making is costly, such as migrants in Shepard et al. (2025). Pure information treatments are not always shown to increase enrollment (Banerjee et al. 2021, Wagstaff et al., 2016), but in a setting where individuals pay penalties for being uninsured, Goldin et al. (2021) find a 1.1 percentage point increase in enrollment (a 1.9 percent effect) from sending reminders. Positive results are concentrated on the poor, highlighting the cognitive load associated with poverty-related stress. Providing more time to enroll and personalized penalty estimates works as well, suggesting other behavioral frictions may be slowing down take-up (ibid.). It is important to stress that in this instance, most of the experiments have been carried out in HICs. Examining validity in other settings where enforcement capacity might be weaker is an important next step for understanding the global impact of behavioral interventions and might be made easier and cheaper by recent advances in digitization.

Experiments increasing product or process quality

In spite of the encouraging results from various types of interventions, product attractiveness remains a barrier to take-up, which can be further compounded by issues in enrollment processes. Banerjee et al. (2021) document that their maximum efforts to foster take-up, both on the price and complexity side, only yield about 55 percent enrollment. It is challenging to offer attractive insurance policies in settings where transaction costs and marketing costs are high relative to the size of premiums. Many studies also evaluate unattractive insurance products, as noted by De Bock et al. (2013) in their review. In a study of a bundle of credit and insurance, Banerjee et al. (2014) test a product where the priority was given to discouraging adverse selection over designing appealing product features. They find that customers are willing to exit microfinance to avoid buying insurance. Low-quality services or enrollment processes can also act as a barrier to insurance demand for health insurance. Nguyen (2020) studies a reform that made healthcare free for children if they went to low-quality community hospitals and finds no effect on take-up. In Indonesia, Banerjee et al. (2021) describe a multi-arm intervention whose effects were largely undermined by administrative registry issues, creating a large gap between attempted and effective enrollment. Finally, Asuming et al. (2024) found that in the context of low take-up in rural Ghana, hospitals sometimes charge both the customer and the insurer and pharmacies experience drug supply shortages, undermining the value of the insurance product to customers and potentially limiting demand.

In line with these examples of perceived or objective design issues, *quality-improving interventions* show high potential. A community engagement intervention in Ghana (Duku et al., 2022) that involved organizing several rounds of meetings, feedback, and follow-ups on actionable steps with practitioners, insurers, and patients increased service quality, increased enrollment by 10 percent (5 percentage points), and improved health measures, though perceived quality did not increase. Tackling patient's perceived quality of care, Delavallade (2017) offered care by a qualified doctor right before renewal of insurance for already insured urban poor individuals in India, increasing poorest individuals' declared willingness to renew. Given quality is multidimensional, more research is needed on which dimensions of care matter most for patient demand, particularly among those unfamiliar with formal healthcare or insurance systems, to better target quality-improvement interventions. Finally, when quality cannot be changed through an experiment, learning about product shortcomings can increase the benefit from insurance by encouraging customers to switch to better products. In an Indian setting where almost half of patients entitled to free care reported making out-of-pocket payments to hospitals, a randomized evaluation designed at improving patients' awareness about their rights, informing them of their outside options, and encouraging them to switch providers or bargain for lower prices reduced out-of-pocket expenses, but only for public hospital patients—potentially due to patients being satisfied with paying for hospital quality at private hospitals (Dupas and Jain, 2023).

Another crucial dimension of care quality lies in supply-side factors. This includes reimbursement systems, care-specific pricing, and, more generally, the incentives faced by hospitals and healthcare providers, which can influence absenteeism, prescriptions, and out-of-pocket payments. While systemic features might not accommodate for experimental work in a straightforward manner, work on physician-side incentives would be instrumental to our understanding of quality of care, take-up, and impact of health insurance. Descriptively, there is also a lack of data on hospital quality, and finding new innovative ways to measure quality in healthcare is necessary to measuring impact. Using the number of days in the hospital for the same procedure as a measure of quality, Morton et al. (2016) document high spatial heterogeneity in service quality across India. In Dupas and Jain (2023), a phone-based patient survey

circumvents the problem of collecting quality data from hospitals with incentives to misreport their misconduct. In this area, technological innovations offer opportunities to better screen and track patients, accommodate seasonal incomes, improve service quality, and enable the collection of more transparent data on customer experience.

IMPACT

In this section, we look at impact along several dimensions. First, we examine the effect of getting health insurance on financial resilience. Next, we look into healthcare utilization and health-seeking behaviors. Last, we address the question of whether insurance leads to better health outcomes. However, research remains limited on several potentially important outcomes—including health beyond mortality, labor and time use, long-term poverty reduction, and spillover effects beyond the insured—that are critical to understanding the broader welfare effects of health insurance.

Financial resilience: Existing research has documented that health insurance typically reduces catastrophic health expenses and medical debt. In a review of health insurance impact in the US, Finkelstein et al. (2018) estimate that health insurance reduces catastrophic out-of-pocket expenditures to zero. Studying the roll-out of comprehensive health insurance to 800 million rural households in China, Gruber et al. (2023) also find a sizable reduction in the share of out-of-pocket expenses in total health expenditures, especially for catastrophic health expenditure. Evidence of positive effects of health insurance on financial resilience in LMICs can be found in Geng et al. (2023), who report a decrease in harmful coping mechanisms among milk producers in Kenya—insured households do not side-sell their milk outside of their cooperative contract when a household member is sick. However, this paper does not discuss selection into insurance. Haushofer et al. (2020) find no significant positive effect of insurance on financial health or financial health-seeking behavior in Kenya. The product offers comprehensive coverage for an annual premium of US\$329 in purchasing power parity (PPP), corresponding to more than 10 percent of GDP per capita in PPP at the time of data collection (World Bank). While these rates do not allow for the specific targeting of low-income households in this setting and thus sets the product apart from the typical micro-insurance product, the study raises an important methodological argument for future insurance research. The authors contend that any subsidy used to measure the impact of insurance through random encouragement also has income effects, justifying the use of control groups that also benefit from an equivalent subsidy. As more financially vulnerable households tend to make decisions that are less aligned with their risk profile, even when experienced with insurance products (Handel et al. 2024), further research on heterogeneity in the effects of insurance across levels and determinants of financial vulnerability would be valuable.

Healthcare utilization: Even when enrollment in health insurance does not decrease overall healthcare expenses, it can increase care-seeking behavior within the same budget constraints. Studies have shown positive effects of health insurance on healthcare utilization among non-elderly adults in the US (Finkelstein et al., 2018), in rural households in Ghana both in the short and long term (Asuming et al., 2024), and among rural and low-income elderly populations in China under the New Cooperative Medical Scheme (NCMS), one of the largest-scale insurance programs in the world that provides comprehensive insurance coverage focused on in-patient care for rural residents (Cheng et al., 2015; Gruber et al. 2023). Gruber et al. (2023) find an 85 percent reduction in the likelihood of reporting a need to refuse necessary care due to financial difficulty (corresponding to a 5.1 percentage point decrease). Improvements in healthcare quality can shift consumption from informal to formal services.

An intervention in urban India aimed at improving the customer experience of healthcare services by offering customers a free check-up with a qualified doctor. For those offered the check-up, willingness to pay to renew the insurance increased enrollment by 19 percentage points from a base of 40 percentage points (a 46 percent increase). For those attending the check-up, the likelihood to use formal healthcare when ill increased by 10 percentage points (Delavallade, 2017). A similar shift (although imprecisely estimated) can be observed from insurance provision to informal workers in Nicaragua (Thornton et al, 2010). For children of formal wage workers in Indonesia, aging out of automatic dependent health insurance coverage not only decreases the likelihood of seeking outpatient care when sick by 5-8 percentage points, but also increases the likelihood of self-medicating (Rizal, 2025). However, more research is needed on the conditions under which the provision of healthcare increases utilization, as recent evidence from two randomized evaluations show. In Kenya, Haushofer et al. (2020) found that providing free health insurance to informal workers had no effect on healthcare use. Similarly, in a recent working paper, Crépon and Pernaudet (2024) examined the impact of informing French unemployed youth about their existing rights to universal coverage—rights most already possessed. This intervention also yielded no overall effect on healthcare utilization, though there was a modest shift in demand from private to public insurance. However, when a random subsample of jobseekers received additional information about their specific healthcare needs through a physician visit, their likelihood of consulting a psychologist doubled (from a baseline of 8 percent), with the effect concentrated among those with greater and more underestimated mental health needs. Importantly, this intervention did not influence utilization for physical health. Here and in other risk-specific questions, information treatments that focus on personalized needs generate more impact than generic awareness campaigns.

Health outcomes are less frequently examined, as they depend on increased take-up and healthcare utilization. In their review of the US, Finkelstein et al. (2018) found that non-elderly adults reported subjective improvements in health, though there is no evidence of impact on objective health or mortality, which might be due to the lack of long-term data (Finkelstein et al., 2018, Finkelstein et al., 2012). This is also the case for Haushofer (2019) among informal workers in Nairobi. In contrast, studies using large administrative datasets have found that health insurance reduced mortality, as in Golding et al. (2021) in the US. Studying elderly mortality impacts of the New Cooperative Medical Scheme in China (NCMS), Gruber et al. (2023) find that the policy reduced mortality and estimates it to be responsible for about three-quarters of life expectancy gains over the 2003-2008 period where it was rolled out. These results on mortality, again, stress the need for careful examination of what is being summarized under the “health insurance umbrella”: For example, the authors of the latter article explain their large results by the comprehensiveness of the NCMS, which included care for mild and chronic diseases on top of acute cases and was introduced jointly with sizable supply-side increases in care. Positive results have been documented for children in India through the Rashtriya Swasthya Bima Yojana (RSBY), a large-scale government-run comprehensive healthcare insurance program focused on vulnerable households that has been shown to have reduced infant and child mortality (Aiyar et al., 2024). This also points to the importance of critical development windows: In rural China, Huang and Liu (2017) document positive effects of being exposed to insurance at ages 0-5 on the health and cognition of adolescents, while later exposure has no effects. The authors also find stronger effects on urban children, which they relate to supply side concerns, and girls, possibly due to institutional specificities.

Non-mortality health outcomes generally improve when health insurance is introduced and taken up. An intervention in Ghana that boosted insurance take-up through medical-technical quality improvements documented a 7 percentage point reduction in the likelihood of illness (Duku et al., 2022). Gruber et al. (2023), studying the NCMS roll-out in China, document improvements in self- and interviewer-perceived health, along with increases in activities of daily living. Two studies find particularly positive results of health insurance exposure at a young age on educational outcomes, either through anemia reduction in urban Peru (Carpio et al., 2025, who find a 1 standard deviation increase in math and reading test scores) and improved household investment in rural China (Fang et al., 2024). On mental well-being, using the randomized distribution of Medicaid to low-income households in Oregon, Finkelstein et al. (2012) document reductions of the order of 31 percent in depression rates and improved self-reported health, but no impact on physically-measured health. Relatedly, Haushofer et al. (2020) find a 14 percent reduction in cortisol levels associated with getting insurance—a “peace of mind” effect that an equivalent cash transfer does not yield, highlighting the distinct role of risk-shifting devices as policy tools. However, even though their physician appointment intervention increases the likelihood of consulting with a psychologist, Crépon and Pernaudet (2024) do not find any increase in perceived health along several categories—perhaps owing to the short duration of treatment (one year). Finally, insurance can have positive effects on the well-being of those responsible for the insured. In Yang and Zhao (2025), informal caregivers also report wanting to remain in the workforce for longer. Studying outcomes beyond the sole insured, and understanding the interdependencies between health and broader systems, such as the labor market and government revenues, is key to estimating the welfare effects of insurance.

Non-health outcomes — informal employment: If healthcare is a meaningful employment benefit, delivering it outside of the workplace can affect formal labor force participation decisions. Si (2021) documents that non-workplace health insurance in urban China increased the rates of temporary and self-employment among female, less educated, and healthier workers. The opposite can theoretically happen when attractive formal health insurance reallocates workers towards formal employment, as Vu and Glewwe (2022) document happens for women in the case of the extension of the length of a maternity leave reform in Vietnam. More research on the effect of health insurance on informality, and for which populations it is relevant, is needed. By reducing the risk of catastrophic health expenditures, having insurance can increase risk-taking at one’s job. After the introduction of subsidized health insurance in rural China, Wang et al. (2024) document increases in entrepreneurial labor that do not come from a decrease in out-of-pocket expenses, but instead the use of precautionary savings, which can then be directed to business creation. This margin is understudied and bears interesting implications for structural transformation and for the effects of health insurance on government revenues through changes in the composition and size of the workforce.

Non-health outcomes — employment: Health insurance could also theoretically change the decision to take up a job. However, there is no evidence from the Oregon experiment that low-income individuals getting Medicaid in the US are more likely to be employed or earn more (Finkelstein et al., 2012). Recent evidence from young jobseekers in France (Crépon and Pernaudet, 2024) finds no effect on employment likelihood from an information intervention on rights to insurance. However, weak evidence indicates that getting a free physician appointment, where one can learn about their specific health needs, increases the likelihood of seeking training at the job center. Finally, the employment effect of health insurance is not limited to the insured. Many households in LMICs also manage small firms with little

separation between their firm and personal accounts, meaning expense shocks can influence firm production decisions such as demand for hired labor. In Thailand, Kinnan et al. (2024) find that in the event of a large negative health shock, firm-owning households reduce their demand for external labor almost entirely and their demand of other inputs slightly. Through this channel, households in their networks are also affected, lowering their production and consumption by an extra 7 percent and 3 percent, respectively, when they are one node closer to the affected household. Importantly, shock propagation is less important when affected households are covered by informal or formal insurance. This important finding bears impact on the cost-benefit analysis of insurance products and highlights the potential for research on the labor market effects of insurance beyond the insured.

The economic literature often documents positive effects of insurance on illness likelihood, mortality, and healthy childhood when products are attractive and thus taken up. However, the quality of healthcare is vital for increasing take-up and achieving positive endline impacts. In Das and Do (2023), the authors pool evidence from 15 studies across many contexts and show that patients are less than 50 percent likely to get the correct care for their symptoms in two-thirds of countries. Again, close examination of the insurance product proposed under the “health umbrella” is needed to verify whether mixed results are indicative of insurance ineffectiveness. Moreover, these positive results are found for specific outcomes, interventions, and populations. Evidence of impact on mental health, although positive, remains rare, and there is no evidence on the value of insurance in promoting preventive health, stressing again the need to build on promising interventions and gain more knowledge.

CONCLUSION

Health insurance can lead to improved healthcare utilization and better health across various age groups and dimensions. However, these positive results are contingent on enrollment, which has generally remained low. This challenge is reflected in the existing literature, where many studies focus primarily on enrollment at the expense of endline development indicators, and where evidence is missing on the most prevalent working segment in LMICs—self-employed workers.

Extending to under-covered segments and outcomes could be made possible by higher take-up. Enrollment barriers, poor distribution processes, and low quality of healthcare and drug supply reduce demand for and impact of insurance products in many instances and constitute promising areas for future research. Several successful examples of evaluations have already been documented to address these challenges by lifting affordability, complexity, or quality barriers to insurance demand. Because these interventions make insurance more attractive, they can also add healthier individuals to the risk pool, lowering premiums in the long-run and increasing its sustainability. However, the opposite is also true from negative results of research studying complex processes or products. Researchers interested in documenting development or welfare-related outcomes could build on interventions or products that have already demonstrated an ability to reach the scale necessary to go beyond take-up and measure such variables. Leveraging long-term data is also a priority for research on the impacts of inclusive health insurance, especially in LMICs.

Finally, some studies above document mixed or no impact of health insurance on demand and/or endline development outcomes, but also evaluate products with important quality concerns. This highlights a question that is present throughout the review: Should one interpret null or negative results on unattractive or non-profitable products or processes as evidence that health insurance does not work?

In economics, demand stems from the interaction of the perceived benefits from a product with its cost. Low demand for insurance products can result from low perceived need for coverage against risk, but could also reflect lack of information, challenges in the enrollment or claims processes, or the quality of third-party environment, such as drug supply chains and healthcare provider quality. Many micro-insurance products that have been evaluated were both new and developed in markets with limited customer understanding and varied economic environments. As such, it may be particularly challenging to draw systematic lessons from early impact evaluations, especially in the absence of comparable product performance measures across studies.

OPEN QUESTIONS

1. Investigating under-documented segments
 - a) How can insurers target entrepreneurs and self-employed workers?
 - i. What are effective risk pooling strategies for those that cannot be covered at the workplace level?
 - ii. What coverage conditions and other product design features best address health risk that reduces income-generating capacity in addition to increasing health expenses?
 - iii. How can registration windows be adapted to irregular incomes while discouraging strategic drop-out of healthy individuals?
 - b) What is the best way to target the highest-potential entrepreneurs and generate spillover effects for potential employees?
 - c) Does providing inclusive health insurance for self-employed workers, whom health events affect through both expenses and income, generate different development impacts than for wage workers? What are the effects of such insurance on entrepreneurs' firms and their risk-sharing networks?
2. Increasing take-up to investigate new outcomes: interventions and design
 - a) What is the effect of documented interventions in new contexts (e.g., behavioral interventions in LMICs)?
 - b) Testing the broader impact of successful take-up strategies on alternative dimensions
 - i. How effective is group-marketing (e.g., employer-based offerings) on reducing adverse selection? Can selecting healthier individuals come at the cost of awareness that they are covered, and how should we seek to ensure consumer protection in this context?
 - ii. What is the price elasticity of demand across products, space, and populations?
 - iii. Simplifying interventions—what are the effects on demand and impact of simplifying enrollment, claiming, and payout processes on various customer segments and settings?
 - iv. What dimensions of health insurance products and/or services matter for perceived quality?
 - c) How can insurance help align incentives between providers and patients? Can interventions impact demand, quality of care, and patient well-being?
 - d) What are the effects of various product improvement interventions—e.g., discounts, simplification of enrollment/claims/payout processes, group offerings, improvements in

quality of healthcare or drug supply—on the health status of insured populations, average premiums, and system sustainability?

- e) How does observing demand in the longer-term inform the impact of diverse interventions—e.g., subsidies—through the added impact of experience effects? Can experience with insurance change the potential for adverse selection through insured individuals learning about their type?
3. Measuring impact: insurance's contribution to development outcomes
- a) What are the direct (health and financial) benefits of health insurance for those insured? What are the indirect benefits (reduced financial burden on state systems, spillover effects on families), and how does that help inform efforts to understand the total benefit of insurance?
 - b) How do private insurance, public insurance, and other social protection programs (e.g., disability or unemployment) interact with each other, in terms of demand, benefit provision, and impact on beneficiaries? What are the resulting welfare effects?
 - c) How can we better measure health outcomes beyond mortality? Can technology enable better measurement of health or care quality?
 - d) What can be learned about the development and welfare effects of insurance by the use of long-term data?
 - e) What coping strategies (e.g., consumption cuts, asset sales, side-selling, time use, employment, schooling) does insurance complement or substitute, especially in LMICs?
 - f) How does insurance affect informal caregivers and the outcomes associated with informal care?

AGRICULTURE

Half of the world lives in households connected to agri-food systems (FAO, 2019). While agricultural risk is too spatially correlated to be effectively shared among communities, agricultural insurance, which could pool this risk at higher levels, is rare and unevenly distributed: 80 percent of insurance policies in developing countries are distributed in India and China, where 60 percent of farmers live (Kramer et al., 2022). Climate change, by increasing the spatial correlation and cost of shocks, has placed risk reduction, mitigation (and with it, insurance), and adaptation at the center of the policy debate (see SDG. Goal 13.1).

Similar to health insurance, agricultural insurance markets are characterized by low take-up and high underinsurance and lapse rates, even with subsidies averaging 80 percent of premiums in China and India and compulsory enrollment for borrowers in India (Kramer et al., 2024, Lichtenberg and Iglesias, 2022). By virtue of the risk and populations exposed to it, agricultural insurance often covers customers encountering insurance for the first time; who might already be more experienced with other risk mitigation tools like credit, savings, and social networks; and who are remote and therefore costly to reach through traditional insurance. As such, while agricultural insurance is almost always provided below actuarially fair prices, with the support of governments or donors, it typically generates little demand. This equilibrium of low supply and low demand of these products limits the availability of evidence on the impact of insurance beyond adoption. We will examine the existing evidence, answering the following questions. First: *Why is agricultural insurance take-up so low in the absence of intervention? Are demand-increasing interventions scalable and cost-effective?* Second, we will ask: *How do development outcomes change, and for whom, when individuals or communities do access agricultural insurance?*

We will cover two types of agricultural insurance products: index-based and indemnity-based insurance. Chantarat et al. (2013) outline the differences between the two products: “Unlike traditional insurance, which makes indemnity payments to compensate for individual losses, index insurance makes payments based on realizations of an underlying—transparent and objectively measured—index (e.g., amount of rainfall or cumulative temperature over a season, or area-average livestock mortality) that is strongly associated with insurable loss.” Whereas index-based insurance has brought down the transactional costs associated with verifying individual losses and reduced concerns of moral hazard and adverse selection, it has also introduced basis risk. Basis risk is the risk that “a contract holder may experience the type of losses insured against but fail to receive a payout if the overall index is not triggered” (ibid). In this section, we summarize the evidence base on both product types, highlighting frequent sources of low agricultural insurance demand including product and process design, in particular basis risk, premium prices, and demand-side factors such as behavioral biases, lack of trust, the existence of alternative mitigation strategies, and knowledge of insurance.

Two notes are pertinent to this section. First, we aim to update several reviews and rely partly on them for older works. Cole and Xiong (2017) explore the history of agricultural insurance systems in both developed and developing countries. Kramer et al. (2022) discuss macro-insurance, donor/government-level dynamics, and promising innovations at this scale. Ali et al. (2020) provide a useful conceptual framework of the different types of behavioral risk barriers to insurance uptake, and Timu and Kramer

(2023) provide a conceptual framework and a review around the gendered impacts of agricultural insurance. We redirect readers interested in these themes to those excellent reviews.

Second, we will cover several types of agricultural insurance products—whether differentiated by the indemnity/index divide or by the types of risks they cover. In line with faster development of index insurance recently, and data and remote sensing improvements, most insurance products documented here are index-based. It should be noted that recent innovations in remote sensing and contract design have reduced basis risk, while digitization has lowered the high operating costs of indemnity-based insurance (Kramer et al., 2022). These innovations have potentially altered the trade-off between the two types of products for certain customer segments. Research on this trade-off is lacking and could be a valuable addition to the literature.

TAKE-UP

Much like the health insurance literature, most studies in this section focus on take-up. Even in developed countries, substantial subsidies are needed to maintain reasonably high take-up: In the US, which had a take-up rate of 85 percent as of 2017, loss ratios have historically been as high as 1.9 (Cole and Xiong, 2017). Finally, in contrast to the previous section, the prevalence of index insurance in developing countries means that adverse selection is a less central issue, although low take-up can still increase operating costs and exclude the most vulnerable populations.

Basis risk: evidence, interventions to reduce basis risk and to increase tolerance to basis risk

In developing countries, where index insurance is predominant, the most cited barrier to agricultural insurance take-up is *basis risk*. Surveying the literature, Lichtenberg and Iglesias (2022) note that in developing countries, farmers receive no compensation in 16-36 percent of cases where they experience significant losses. Jensen et al. (2016) find that households in Northern Kenya retain about two-thirds of their original risk after purchasing index-based livestock insurance. Experimentally varying the level of basis risk through distance to the rainfall station, Mobarak and Rosenzweig (2012) show that for every additional kilometer of perceived distance to the rainfall gauge, demand drops by 6.4 percent. Importantly, apart from the results above, studies do not typically collect or show data on the protection performance of the insurance products they study. This lack of systematic monitoring of the protection performance of index insurance products complicates the interpretation of demand results: As Jensen et al., (2016), cited in Morsink et al. (2016), argue low demand may reflect uncertainty about whether households are being offered a meaningful protection device or merely a lottery ticket. Morsink et al. (2016) propose measures based on actual and subjective production outcomes and index trigger data that could enable systematic benchmarking of the protective performance of various index insurance products. In this section, we will explore two broad types of contributions on basis risk: Some works rely on innovations that reduce the level of basis risk, while others address household capacity to manage it.

Innovations to reduce product-level basis risk include flexible contract design, changes in the index, or combinations thereof, as well as redefining reference areas. Using data from Uruguay, Ceballos and Robles (2020) simulate the welfare of farmers under flexible products allowing them to combine coverage rates rather than choose a single level of coverage, and estimate significant demand and welfare gains, up to a tripling of welfare for one-third of farmers. Lichtenberg and Iglesias (2022) show theoretically that allowing households to choose the insurance trigger and coverage rates can increase

demand. Interestingly, households in their study are estimated to prefer insurance with rarer payouts and lower premiums. The formulation of the insurance product itself can increase take-up, as shown in theoretical models of hybrid products that consider both area yield and weather indexes (e.g., Xiao and Yao, 2019). For now, however, the current state of the empirical evidence does not match theoretical results: Hill et al. (2019), studying such a product in Bangladesh, find no demand for it at an actuarially fair price. More research on this topic could be valuable.

New theoretical work on machine-learning algorithms that design better insurance areas—the geographic zones covered by the same index insurance value—could lower basis risk and increase take-up.

Estefania-Salazar et al. (2024) demonstrate that new boundaries can increase the expected value of insurance by 60 to 200 percent while maintaining the same total number of areas in the case of Index-Based Livestock Insurance (IBLI) in Northern Kenya. This aligns with other efforts to better design insurance areas, including developing more granular Normalized Difference Vegetation indexes that allow for sub-insurance-unit measurement (De Oto et al., 2019), accounting for elevation and slope (Rigo et al., 2022), and grouping zones across soil properties (Arias et al., 2018). Taking these new algorithms from theoretical to real-life take-up and impact is an opportunity for research.

Importantly, implementing any of the basis-risk-reducing interventions mentioned above is only feasible when data on basis risk is available, which depends on product maturity. Unlike other insurable risks, the realization of agricultural shocks and payouts is infrequent and products might take several years to be calibrated and refined. This is well illustrated by examples of low demand and high basis risk in very new index insurance products, like Ahmed et al. (2020) in which only drought was covered in a setting with flood risk exposure. These characteristics of agricultural risk can potentially explain low take-up and limited impact in short-term evaluations of new insurance products. They also suggest that sustained demand support, such as subsidies or extraordinary payouts during basis risk events, might allow demand to build in the early stages of a program, when trust and experience are still developing, while also generating feedback that improves product quality over the long term.

Interventions increasing tolerance to basis risk: Informal insurance is a very common risk-management tool when formal insurance is lacking or has significant basis risk. A small literature studies the interplay between informal and formal risk-management, and their consequences on the demand for formal agricultural index insurance. On the theory side, Annan and Datta (2022) provide a framework and show that more informal risk-sharing can either reduce insurance demand through less need for external risk mitigation, or increase demand for formal insurance, if more informal risk-sharing helps cope with basis risk and basis risk was the main barrier to insurance demand. This is reflected in empirical work showing that the effects of informal insurance on demand for formal insurance depend on the characteristics of informal insurance, and in particular whether the properties of informal insurance are akin to those of an index product. Mobarak and Rosenzweig (2012) examine various structures of risk-sharing groups across three Indian states and show that index insurance take-up depends on the generosity and reactivity to weather of the pre-existing risk-sharing agreement. At the mean distance to the nearest rainfall station, groups that share only idiosyncratic risks are 20 percentage points more likely to purchase index insurance. However, this is not the case for solidarity systems with an index component: A 1 standard deviation increase in the generosity of group payments linked to weather conditions decreases the probability of take-up by 3.6 percentage points (9 percent). In Ethiopia, Dercon et al. (2014) study the offering of insurance to iddir (funeral societies with high levels of trust) and show that training the iddir

leader to think about risk-sharing leads to a 12 percentage point, or 67 percent, higher take-up of index insurance. Studying the symmetric link in Southern Ethiopia with Index-Based Livestock Insurance (IBLI) provision, Takahashi et al. (2019) find that providing insurance does not crowd out informal risk-sharing mechanisms. Relying on the right solidarity groups can increase the take-up of index insurance, and research on the nature of such groups across contexts would be instrumental in increasing the cost-effectiveness and scalability of these initiatives.

Other formal interventions can make basis risk more tolerable: Kramer et al. (2022) mention interventions aimed at reducing downside risks, such as the possibility of appealing when indices are not triggered. Alternatively, there exist several basis risk funds providing the same function as solidarity groups for idiosyncratic risks. For example, the Caribbean Catastrophe Risk Insurance Facility (CRRIF) has added a basis risk mitigation component in the form of a second trigger that provides lower payouts if half of the initial trigger value is met (ibid.). Testing the effects of the introduction of such formal innovations on informal and formal risk mitigation strategies could be a good research avenue.

Price and liquidity interventions

Even when basis risk is mitigated, take-up may still be low, especially in the absence of *subsidies*. For instance, Hill et al. (2019) in Bangladesh documented that, for a hybrid product that arguably offers better protection against basis risk, there would be no demand at actuarially fair prices. In all of their specifications, there needs to be a discount of least 15 percent on the actuarially fair cost of insurance for the average farmer to purchase at least one unit of insurance. Ahmed et al. (2020) and McIntosh et al. (2013) find almost no demand at commercial prices for index products in Ethiopia. In fact, most studies with non-null take-up discussed here include a subsidy component, which appears essential for stimulating any take-up.

Alternatively, the *timing and nature of payment* can be an even more critical driver of demand than subsidies. A striking example of this is found in Casaburi and Willis (2018), where subsidizing insurance alone led to only a 1 percentage point increase in take-up, but offering the option to delay insurance payment until harvest time increased take-up from 5 percent to 71 percent, which the authors show is partly due to liquidity constraints and present bias. In Ethiopia, Belissa et al. (2019) found comparable results through another randomized evaluation. Hill et al. (2019) in Bangladesh discovered that while a 70 percent discount increased insurance take-up to 3.5 units from an initial zero, this uptake was 56 percent lower among those offered a rebate compared to those receiving a discount, suggesting significant present bias. In line with these insights, in Burkina Faso, Serfilippi et al. (2020) find that changing the framing of an insurance policy from fixed prices and uncertain benefits to uncertain prices and benefits through the introduction of a premium rebate in bad years increase declarative willingness to pay by 10 percent (from a basis of 151 percent of the actuarially fair price) even if actuarial value remains unchanged. From various studies in the Ethiopian context, there is suggestive evidence that farmers have a higher willingness to pay with their labor than with cash, even when accounting for local wages (Tadesse et al. 2017). These are important findings, although they are qualified by the low correlation between willingness to pay and actual take-up stressed in the same setting by McIntosh et al. (2013). Finally, in a recent experiment, Cai (2026) finds that beyond prices, the number and relative prices of insurance policies can influence demand in the context of crop insurance in China, where demand for the basic option increased by 20 percentage points (from a baseline of 40 percent) when a more expensive option

was also offered. Experiments offering money-back guarantees have also been shown to increase take-up, although not enough to make policies cost-effective (Gaurav et al., 2011).

Several caveats apply to the positive results on subsidies and delays in payment. First, in settings where policies are not bundled with loans, Kramer et al. (2022) emphasize that limited enforcement capacity might undermine the effectiveness of delayed payments or installments. Cole (2015), documents a lapse rate of over 20 percent for most major insurance companies in India, meaning insured households lose their protection, which undermines policy sustainability, especially if exit is strategic. In the case of subsidies to bundles of insurance with loans or other products, research shows that poorly designed insurance can decrease demand for both products in the bundle (Banerjee, 2014), again highlighting the issue of product attractiveness. This underscores the need for careful examination of the effects of introducing these bundled products. Kramer et al. (2022) note that subsidies might favor public programs at the expense of potentially better private initiatives, taking as an example the government crop insurance scheme in India (Pradhan Mantri Fasal Bima Yojna, PMFBY) and its lengthy claim settlement procedures. Recent process innovations, such as competing on price for government contracts with fixed characteristics, might resolve this, although they could undermine incentives to innovate on non-price value creation. Finally, agricultural insurance comes with large electoral stakes, particularly in countries with large agricultural sectors. Knowing more about the impact of government-given subsidies, as compared with those given by other parties, would be a useful addition to existing knowledge.

Financial literacy and trust interventions

Insurance policies are often complicated, and many individuals are unfamiliar with them; this can suppress demand. While this is the case for all products, the characteristics of the agricultural customer segment make lack of experience with financial products and low financial literacy significant barriers to demand. In Ceballos and Robles (2020), estimates of optimal portfolios in Uruguay equate not understanding the product to halving its expected value. In Ahmed et al. (2020), a product disseminated through an indirect marketing strategy generates no demand at commercial prices, and the fact that very few respondents declare having met with an insurer representative suggest misunderstanding of the policy as a key explanation. In line with this insight, in Cai et al. (2015), holding an intensive information session about a subsidized agricultural product in rural China led to a 14 percentage point increase in demand from a baseline of 35 percent (a 40 percent increase), and in Ahmed et al. (2020), randomized promotion of the product leads to lasting increases in both comprehension and demand. We now examine interventions aimed at training customers, changing the scale of insurance purchase to involve more financially sophisticated actors, targeting products to households benefiting the most from them, or inducing experience effects. Other behavioral barriers to insurance adoption such as self-control, difficulty understanding low probability events, or ambiguity aversion are explored in Cole and Xiong (2017).

Efforts to improve *financial literacy* through customer education have yielded mixed results, and successful interventions are often difficult to scale. For instance, Cole et al. (2013) found no effect from teaching about the precise relationship between soil moisture and rainfall in India. Gaurav et al. (2011) achieved significant increases in take-up, albeit only up to 16 percent, with a much longer two-day financial education program in India. Takahashi (2016) shows that a training kit in Ethiopia increased knowledge but did not improve take-up. General rules of thumb might be more effective than theoretical training in

the case of agricultural insurance: Studying an indemnity-based rice insurance product in China, Cai and Song (2017) find that while providing customers with training on calculating expected payouts does not increase take-up, giving them information on expected frequency of disasters and at which frequency a risk-neutral individual will want to purchase insurance increases take-up by 30 percent.

Financial literacy can also be acquired through *experience*. In Karlan et al. (2014), having received a payout is associated with an increase of 5 percentage points in take-up of index insurance from a baseline of 44 percent (nearly a 10 percent increase), and not receiving a payout also decreases future demand by 17 percentage points. Cai and Song (2017) and Cole et al. (2014) document instances where experiencing insurance payments increases take-up. In the former, playing a game with repeated insurance-resembling lotteries and experiencing payouts increases purchase of a subsidized indemnity-based rice insurance product in China by 9 percentage points from an initial 20 percent. In the latter, demand increases both as a result of individual experience or of another village member experiencing a payout. Importantly, these effects are related to immediate memory, which means they can go in the opposite direction in case of bad experiences with insurance such as long turnaround times. However, new work shows that financial education makes learning from experiences more persistent: In Cai et al. (2020), customers who were randomly given financial education rely less on immediate memory from payout experiences to make subsequent purchase decisions and have overall higher take-up. This finding has implications for the earlier result that customer education is not scalable. Although the immediate effects of customer education programs might not make up for the costs of training, longer-term impacts on enrollment and reduced cyclical demand with respect to payout experiences could make the training more profitable in the long run, highlighting the value of long-term research.

When experience is lacking, *trust* in others and others' experience can also increase take-up. In Cole et al. (2013), insurance take-up in India increased by 20-25 percent if the agent was a trustworthy community member. In Ethiopia, take-up doubled (to 15 percent) when insurance was proposed by a trusted leader within an iddir, an informal funeral insurance institution (Belissa, 2019). In Bangladesh, the positive results of Hill et al. (2019) can potentially be driven by implementing with a well-known NGO. This suggests that financial education should be delivered by neutral and trustworthy actors. In a randomized evaluation in China, Cai et al. (2015) examine the effect of learning about rice hybrid insurance from a friend by holding information sessions two days apart. Having more friends in the first session rather than the second increases demand by 5.8 percentage points from a base of 35 percent, or as much as a 13 percent drop in the premium would, an effect that is larger when the friend is closer. Importantly, the effect is mostly driven by sharing information about the insurance scheme rather than purchasing decisions, which friends do not usually share—although having this information does encourage imitation. This matches results from Karlan et al. (2014) where index insurance demand is correlated with network members receiving payouts the year prior. Interestingly, where own experience dictates both increases and decreases in future demand, in Karlan et al. (2014), negative experiences reported by friends do not lead to take-up decreases. Beyond personal trust, *institutional trust* also matters for take-up. Pre-existing customers at an insurance company are 8 percentage points more likely to purchase a new product (Giné et al., 2008). In contrast, in Ahmed et al. (2020), an indirect marketing led by the insurer limited both direct contact between farmers and the insurer and insurance demand. Research on whether distributing a more popular pre-existing product can increase subsequent demand for agricultural insurance could therefore represent a valuable contribution. Finally, although micro-insurance is the primary focus of this review, it is worth noting that targeting more sophisticated but still

trusted and close meso-level customers can help alleviate complexity barriers without undermining trust (Kramer, 2022).

It is worth noting that trust, financial literacy, or exclusion from digital finance could potentially be more stringent barriers to *insurance acquisition for women* (Akter et al., 2016; Cai et al. 2015). Beyond trust or understanding, gendered patterns of labor allocation within the farm and the family could make agricultural insurance products differentially attractive across genders. In a recent working paper, Arteaga et al. (2023) study a setting with tight gender roles resulting in different allocation of tasks and risk exposure levels. In that context, random changes in the formulation of an index insurance product that make it more targeted to women-specific risks increase demand by 10 percentage points, but only within the sample of households that had been subsidized before, suggesting the existence of experience or trust barriers. More work is needed on gender-specific take-up and effect of agricultural insurance. Surveying the literature, Timu and Kramer (2023) note that among the studies/work they survey, only eight studies have an explicit gender dimension and five address the unequal distribution of insurance benefits, while none look at empowerment outcomes.

In conclusion, there are significant price, complexity, and trust barriers to insurance acquisition, the most sizeable being basis risk and premium cost. However, lack of demand is not uniform or automatic. The relatively high demand encountered by IBLI products in East African countries, for example, has been related to several design features, notably index design and claims experience. This further emphasizes the importance of clearly delineating product features that allow for direct cross-paper comparisons (see Chantararat et al. (2013) for more details on IBLI index design). Although customer financial education is often hard to achieve in a cost-effective and scalable manner, government action at earlier ages or the giving of simple rules of thumb could hold some promise for policymaking—with the additional potential benefit of decreasing the cyclicity of demand driven by reliance on payout experience. In parallel with efforts to increase take-up, more heterogeneity studies are needed to gain finer insights into the determinants of adoption.

IMPACT

Any development impact of introducing an insurance product is dependent on its risk protection performance. When insurance products function as intended and are adopted, there is relatively solid evidence that risk protection reduces the use of costly coping mechanisms, and encourages riskier, more productive investments.

Financial resilience and costly coping mechanisms: When faced with poor yields, farmer households may sell productive assets, particularly if they are cash constrained. In such cases, insurance can have a positive effect on financial resilience. IBLI has been shown to reduce distress sales of livestock in Kenya and in Mongolia (Bertram-Huemmer and Kraehnert, 2018, Jensen et al., 2017, Carter and Janzen, 2019). In the IBLI Mongolia case, the authors document a realized shock event and show that payouts induce more herd growth in the medium term. In Northern Ghana, Karlan et al. (2014) find that providing insurance leads to an 8 percentage point decrease in the likelihood that a household misses a meal from a base of 70 percent (an 11 percent reduction), an effect similar to a capital grant twice as large. Recent work shows that coping mechanisms vary across income levels: When Kenyan households are asked to think about their coping strategies, richer households are more likely to cite selling productive assets, while poorer ones are more likely to cite reducing consumption—with insurance reducing reliance on both

mechanisms (Janzen and Carter, 2019). Finally, landless households also face exposure to agricultural shocks through decreases in casual agricultural labor opportunities. For them, migration is a coping mechanism that insurance provision can affect. Ex-post, Mobarak and Rosenzweig (2013) noted that landless households migrate less and work less during rainless seasons when provided with insurance. Ex-ante, Munshi and Rosenzweig (2016) find that, because informal insurance is local and can thus tie workers to their place of birth, providing formal insurance could encourage permanent migration to urban areas, especially for poorer men. These findings relate to structural transformation and urbanization, and studying the interlinks between agricultural insurance and these processes could be a valuable addition to existing research.

Lastly, an important harmful coping mechanism is *conflict*, which can primarily be caused by increased resource competition in scarce contexts. This is especially true for pastoralists, who often have to travel farther from their base camps into disputed areas when forage is scarcer (Gehring and Schaudt, 2026). There is thus a channel for insurance to reduce conflict by reducing migration incentives. Studying IBLI Kenya, an index insurance product that pays instantaneously when forage indexes drop and allows for immediate consumption smoothing, the authors find that it reduces the occurrence of conflict after shocks at the local scale. When IBLI coverage increases by one standard deviation in a neighborhood, the impact of droughts on conflict experience is reduced by 23 percent, both through consumption smoothing with payouts and ex-ante investments in smaller herds, lowering pressures on resources. This migration channel finding is echoed in Sakketa et al. (2025), who study IBLI in Ethiopia and show that the negative effect of insurance on conflict is concentrated in zones 30 kilometers away from the base camp, consistent with conflict occurring along unusual and stranded migration routes. Contrasting with these purely positive results, recent evidence points to another, supplementary mechanism: When resources are abundant, the increase in the gains to violence can actually increase conflict, especially if having insurance allows for more risk-taking. In Kenya and Ethiopia, Jensen et al. (2025) find that while IBLI payouts reduce the likelihood of experiencing raids during periods of forage scarcity, and while insurance still reduces the overall chance of being raided by almost 1 percentage point, IBLI *enrollment* can increase it in times of unusually high pasture through a behavioral risk-encouraging effect of insurance provision pre-shock. While this body of evidence is consistent, IBLI products are specific to pastoralism, with both herder-farmer and intra-herder conflict being prevalent issues across Africa, and are associated with higher take-up rates than other products found in the literature. Producing long-term data on conflict experience from other client segments and products would help establish the generalizability of these findings.

Consistent with this last finding, having agricultural insurance is generally found to be associated with *riskier investments*. Seminal work by Karlan et al. (2014) notes that giving insurance leads to a shift to riskier crops and an increase in cultivated areas, which capital grants of similar magnitudes do not achieve. Cole and Xiong (2017) conclude that providing agricultural insurance typically leads to riskier investments on the intensive margin—planting more cash crops, choosing riskier varieties of the same crop, raising more of the same livestock, or making riskier production choices, although there is less evidence for extensive margin choices such as starting an entirely new line of crops. In Kenya, Jensen et al. (2017) document a significant increase in livestock investment (mostly veterinary services) and income induced by IBLI as compared to equivalent cash transfers. In an experiment across three Indian states, Mobarak and Rosenzweig (2012) find that households with a higher demand for insurance, who were more likely to adopt it when offered, increased their production of high-yield rice and decreased their

production of drought-resistant rice by 5 percentage points each in their total production when belonging to the treatment group. In Bangladesh, Hill et al. (2019) find that the intention-to-treat effect of being offered hybrid index insurance with a large subsidy increased the use of inputs by about 25 percent relative to the control group in the monsoon season and by 15 percent in the dry season, along with an increase in the area cultivated. However, this should be interpreted with caution because risk and payouts were realized for everyone at the end of the monsoon season, which could inflate the dry season results. Using 10 years of data on IBLI adoption in Kenya and Ethiopia, Barrett et al. (2026) show in a recent working paper that the investment effect of insurance, through differentials in productivity in the household, can have unintended spillovers on other family members. The authors find that randomized encouragement of insurance take-up leads to a 48 percent decrease in the share of small animals herded, with herd composition shifting to cattle over the decade.

Importantly, due to the organization of agri-food systems, riskier behavior at one end leads to *changes in outcomes beyond the insured*. This is illustrated in Mobarak and Rosenzweig (2012), where insured landowners increase variability in farm workers' incomes. As noted in Cole and Xiong (2017), getting insurance could also change the supply and demand of credit in directions that depend on, among other factors, whether credit already provides implicit insurance (Giné and Yang, 2009), and whether insurance is interlinked with the credit product or offered on a standalone basis. Cai (2016) finds that insurance provision in China increases the amount of borrowing by 29 percent. Distinguishing between demand-side and supply-side rationing, Belissa et al. (2020) find suggestive evidence that the adoption of a standalone index insurance product decreases credit rationing, mostly by reducing supply-side rationing by banks. More work on the interaction of insurance with markets for credit, fertilizers, or farm production factors would be instrumental to our understanding of the costs and benefits of insurance for rural settings in LMICs. Studying the insurance-induced long-term shift in herd composition towards larger cattle, Barrett et al. (2024) find spillover effects on the whole family. Indeed, because smaller animals can be herded by children, which is typically not the case for cattle, insurance is associated with sizable increases in educational attainment among children who were school-aged during the intervention, likely induced by reduced demand for child labor. Changes at the level larger than the insured or their household can also appear if insurance has an effect on public finance: Janzen et. al. (2021) show theoretically that introducing insurance might reduce pressure on social protection by protecting the vulnerable from falling into poverty and encouraging higher-yield, riskier investment. Validating these theoretical insights using long-standing policies and long-term data could improve our understanding of the welfare effects of insurance.

CONCLUSION

Agriculture is subject to high risk, which will likely increase with climate change and is difficult to self-insure against. Research highlights positive impacts of inclusive agricultural insurance on harmful coping mechanisms, including conflict, distress decapitalization, and the mobilization of other household members. When explicitly compared to alternative risk mitigation products like cash transfers, insurance often has larger effects on outcomes that pre-date risk realization—for example, investment, peace of mind—highlighting the complementarities in such products for development policy. However, these positive effects are conditional on insurance being taken up, which is a sizable barrier for both index and indemnity-based insurance, as both research studies and real-world examples show. The interpretation of

this low demand is complicated by wide variation in the protection performance of products that are documented, which often goes unmeasured.⁴

Agricultural insurance targets customers that are remote and more likely than other segments to have no experience with insurance products, and supply- and demand-side issues can make products costlier to distribute and harder to price and refine. This ultimately results in low demand from customers who have little initial experience with insurance, limited trust, and many alternative formal and informal risk mitigation strategies. Several promising avenues have been identified, with potential for new innovations around basis risk, liquidity, contract design, and simplified processes. Research projects either building on products and interventions that have shown potential to generate large enough scale to quantify development and welfare outcomes, or studying novel ways to do so, are priorities for research in this risk.

OPEN QUESTIONS

1. Increasing take-up to investigate new outcomes: interventions and design
 - a) Investigating the effect of promising new interventions
 - i. Cost-reducing interventions: what is the effect of new innovations around remote sensing, zoning, and contract design? Do mobile money and digitization help alleviate well-known barriers to interventions, such as payment enforceability, operating costs, or claim process complexity?
 - ii. Basis risk-reducing interventions: can we design contracts that grant flexibility over unit choices, contract trigger, or coverage rates? What would be the effect of such contracts on demand and re-enrollment? What would be the effect of using new insurance zone algorithms in scheme design? What are the relevant risk-sharing groups for products with basis risk, and does introducing agricultural insurance at these levels work better? What is the impact of introducing formal basis risk funds on take-up, impact, and substitution to and from informal groups?
 - iii. Trust interventions: what is the effect on take-up of bundling insurance with more trusted or established products, through bundling with credit or other insurance schemes? Is it more cost-effective to introduce insurance through trusted focal points or through proxy experience from already insured peers? Can AI-driven digital advisory services play a meaningful role in customer education, sales, and servicing of insurance products?
 - b) Scaling good interventions
 - i. How can interventions shown to have promise (such as allowing customers to delay payment until harvest) be implemented at scale? Can digitization and other interventions help deal with limited ability to enforce contracts?
 - ii. How can we ensure government subsidies do not encourage the wrong programs in terms of customer service and endline impact?

⁴ Jensen et al. (2019) propose a list of which factors matter most for demand and should systematically be collected: “To maximize value, contract design needs to address [...] the relationship between the index and losses, preferences and constraints faced by prospective clients, frequency and timeliness of payouts, the simplicity and flexibility of the contract, as well as the modalities of payouts. Despite the growing efforts, there is no uniformity in the way these important quality aspects of index-insurance products have been evaluated.”

2. Measuring impact: insurance's contribution to development outcomes
 - a) Under-covered outcomes:
 - i. Risk mitigation performance — how substantially does insurance help with consumption smoothing or reduce the use of costly coping mechanisms, both ex-ante, and when adverse risks occur?
 - b) Heterogeneity analyses: how does insurance perform across gender, age, occupancy statuses, and education?
 - i. In particular, how does the gender effect of insurance change with patterns of crop segregation?
 - c) Cost-benefit analysis: what projects are attractive and effective enough to be scaled, and what actors should be involved in these collaborations?
 - i. In particular, do education and experience effects change the cost-benefit analysis of agricultural insurance products when implemented and evaluated in the long term?
 - d) Targeting — which individuals should be covered by insurance and is insurance getting to them — in particular when land property is not held by those cultivating the land?
 - e) The interplay between insurance and other formal and informal risk management strategies:
 - i. How does insurance perform, in terms of resilience to shocks, as compared to risk-management alternatives such as credit or protective infrastructure?
 - ii. Do disaster aid programs crowd out insurance demand?
 - iii. In what settings and contexts is formal insurance a substitute, versus a complement, to informal solidarity groups?
 - f) Broader perspectives
 - i. What are the effects of insurance on third parties (e.g., banks, farm workers, consumers)?
 - ii. What are the welfare, structural transformation, and urbanization implications of insurance and its effects on local economies?
 - iii. What can we say about the political economy of insurance subsidies? How can political support be built for efficient and/or welfare-enhancing insurance subsidies? How can potential misallocation or distortion effects be mitigated?

LIFE AND FUNERAL

The financial burden of funeral costs and the loss of income due to the death of a breadwinner or caregiver is a significant concern that individuals often seek to mitigate. In South Africa, Berg (2018) documented that 28 percent of adults informally insure themselves for funeral costs and that a further 7 percent have voluntary private funeral insurance. In India, life insurance—both a savings vehicle and a protection product—can constitute up to 20 percent of household savings (Anagol et al., 2017). Research has shown generally high take-up rates for life/funeral insurance, exceeding 60 percent in the case of a voluntary product in Mexico (Bauchet and Morduch, 2019).

Partially owing to the particular nature of the risk of death, life and funeral insurance products are subject to substantial demand. They are typically cheaper and potentially easier to understand than other insurance products. In some contexts, they deliver protection against costly shocks: According to Case et al. (2013), in South Africa, an adult male's funeral can represent up to a year of a worker's income. From a supply perspective, risk realization is easily verifiable, payout delivery is straightforward, and there is demand from third parties, such as lenders who have made it compulsory for borrowers to obtain protection against income-decreasing shocks, such as death or debilitating accidents. The *Landscape of Microinsurance 2024* states that life and funeral insurance products have historically dominated micro-insurance systems and cover 80 percent of people reached so far. As such, studies documenting life or funeral insurance interventions predominantly examine products that are already mature, privately delivered, and scaled (Auriol et al., 2021, Anagol et al., 2017, Bauchet and Morduch, 2019).

We group life and funeral insurance products together because both terms designate products that pay out following the death of a relative. However, the products that exist are widely different in ways that are not fully reflected by this semantic distinction. The *Landscape of Microfinance 2024* defines funeral insurance as insurance that pays only for funeral expenses in the event of death. Life insurance, the largest formal insurance product in terms of customers reached, differs from funeral insurance along one or two dimensions. First, customers might be able to use payouts for uses other than funeral expenses (term life products). Additionally, benefits can sometimes be accessed before the time of death (for example, in whole life products), making the product closer to a savings service rather than a pure protection service.

In reality, however, whether a product is commercialized as funeral or life insurance does not strictly follow this mapping. First, life insurance policies are often bundled with credit loans, which can lead to insurance payouts being redirected toward loan repayment, contradicting the definition based on unrestricted use of payouts. Conversely, high levels of informality can make it hard to track the use of funeral insurance payouts, somewhat undoing the mandatory use of the payout component of funeral insurance. Finally, national differences in regulation and authorization to deliver life insurance can make similar products fall under different classifications depending on the context. This diversity of semantics has consequences on consumer choice and levels of protection, especially in low-financial literacy settings, and deserves more research. In this review, we will refer to works based on the name under which the policy is delivered, noting potential differences from the policy's definition when relevant. Despite high take-up rates and high market penetration—according to the *Landscape of Micro-Insurance*, more than 200 million individuals in LMICs are covered by life or funeral insurance—research on these

risks is scarce. One potential reason could be the relatively rare occurrence of death, increasing the cost and duration of interventions designed to study outcomes beyond ex-ante behavior and take-up. We will go into detail about studies covering these products, noting that their settings differ widely and that research applying these policies to other settings would be useful.

TAKE-UP

Consistent with evidence from other risks, pure information treatments increasing awareness of the availability of life or funeral insurance do not usually result in higher take-up, as is shown through null results of a randomized evaluation among churchgoers in Ghana (Auriol et al., 2021). Like existing literature on other products, working with irregular income schedules is successful in improving demand. Looking at life insurance and payment modalities for women's groups involved in microfinance, Bauchet and Morduch (2019) examine a voluntary life insurance product that was offered to these borrowing groups. They show that allowing for payments in small installments leads to increases of 59–74 percent in insurance take-up from a base take-up rate of 62 percent, even as smaller installments are associated with much higher interest rates (i.e., 70 percent annually).

Life and funeral insurance products are often associated with higher take-up than voluntary products across other risks. However, high take-up can result in adoption of ill-fitted products when the incentives of third parties are not aligned with those of consumers, and when many product types are distributed under the same category, which might undermine endline impact, welfare, and consumer protection. Drawing from four experiments involving mystery shoppers and life insurance advisors in India, Anagol et al. (2017) present evidence of agents deviating from providing advice strictly tailored to consumers' needs. First, the authors show that agents favor products that yield higher commissions (in that context, life insurance products that combine savings and protection yield higher commissions compared to pure protection, or term life, products). Agents appear to cater to consumer beliefs, which is only slightly mitigated by increased perceived competition among advisors. Disclosure regulations are only partially efficient in eliminating opaque commission systems. As the authors note, identifying the source of this misguided advice is complex, as advisors may themselves hold false beliefs while also seeking to maximize their profits. Interesting avenues arising from the contrast between these two studies is the question of what can be gained through the bundling of life insurance products with others, as well as the interaction of this with new technologies allowing for improved advising of prospective customers and better training of advisors.

IMPACT

Most of the research on the impact of life insurance looks at ex-ante behavior, particularly the substitution between formal insurance and informal mechanisms for mitigating the impact of breadwinner death. Auriol et al. (2020) examine the impact of funeral insurance provision on religious behaviors in Ghanaian Pentecostal communities. Enrolling individuals in funeral insurance—products designed to meet the setting's large funeral costs, although payouts do not seem formally tied to death expenses—for free reduces direct investment in the church and payments to individuals described as “deserving” by religious teaching in a dictator game, suggesting that individuals view their private relationship with God as a protection mechanism substitutable for insurance. When coping mechanisms involve raising children as potential alternative income sources, the provision of formal insurance can have positive effects for and beyond the insured. Studying fertility behavior in Senegal, Lambert and Rossi (2016) show that wives who face rivals in the inheritance process and do not have a son are 1.5 to

2 times more likely to have short birth spacing, putting themselves and their future children at risk and suggesting that having a son is perceived as insurance against the loss of income associated with the death of a husband. Descriptive evidence from other contexts (Case et al., 2013; Berg, 2018) show the prevalence of other types of informal insurance: For example, 25 percent of households declare borrowing money to pay for funerals in Case et al. (2013). Studying the interaction of formal life insurance with these multidimensional informal risk management strategies could be a valuable extension of existing research.

CONCLUSION

Despite evidence that life and funeral insurance can crowd out other, potentially costlier or less efficient types of informal insurance, research is too scarce to draw firm conclusions on how funeral and life insurance interact with different customer groups and informal insurance environments. Further research on identifying the appropriate risk-pooling groups for such insurance and understanding the barriers that need to be addressed to achieve take-up rates commensurate with the high costs of associated events would be a valuable addition to the literature. Finally, although take-up rates are quite high already, further research on identifying existing barriers, particularly those to the take-up of the most adapted products for customers' risk profiles, would be useful, as research points to significant margins of improvement and a sizable potential market. Behavioral biases such as present bias or difficulty conceptualizing catastrophic shocks are interesting avenues on this matter.

Beyond ensuring that customers choose the right products for them, more work needs to be done in ensuring that they are provided the service they purchased: The median claims ratio (total claims paid/total premiums) is 16 - 25 percent across regions, although the global median is higher for more mature products (*Landscape of Microinsurance*, 2024). The large penetration and multiple roles of this product, between protection and savings, make it a potentially promising tool for far-reaching impact, highlighting the relevance of research on the subject. The recent development of mobile money as a means of payment for such insurance (10 percent globally pay for insurance through mobile money, and 27 percent in Africa) and the potential for reduced turnaround times (5 days in Africa) could constitute interesting value additions to study (ibid.).

OPEN QUESTIONS

1. Investigating under-documented risks
 - a) Funeral and life insurance: there is a gap between the state of the literature on this risk and the share of these products in household savings and insurers portfolios.
 - b) How can we design products that open life and funeral insurance to previously uninsurable groups (e.g., those with chronic diseases)?
2. Increasing take-up to investigate new outcomes: interventions and design
 - a) Building evidence on promising interventions: what are the effects of offering voluntary life insurance products on pre-existing credit networks? What is the impact of this product compared to compulsory credit-life?
 - b) Identifying demand determinants: what features of policies do customers value: higher claims ratios, faster turnaround time, or greater flexibility in how payouts can be spent?
 - c) Good take-up beyond high take-up: aligning incentives and monitoring the effect of third parties on the allocation of demand

- i. Can technological advances, such as videos and LLMs, help to better train advisors or inform consumers about the type of product that fits their needs and characteristics?
 - ii. Can product design (for example, bundling) help eliminate some of the potential mis-selling risks associated with commissions? How can we ensure that bundling does not come at the price of customer awareness?
 - iii. How can one better design incentives for those who advise customers? For example, can digitization allow commission payments to be backloaded in ways that reduce policy “lapse”?
 - iv. Are low claims ratios the product of low consumer awareness, and can increasing awareness of benefiting from bundled products improve their impact?
- 3. Measuring impact: insurance’s contribution to development outcomes
 - a) What is the effect of insurance offerings on the economic well-being and coping strategies (including distress sales of assets, labor market participation) of the surviving relatives after the insured’s death? What is the effect on other non-economic outcomes, such as psychological well-being?
 - b) Ex-ante, what is the effect of insurance offerings on the insured’s behavior and risk-taking?
 - c) Does the introduction of formal savings products crowd out demand for life insurance products, and with what consequences on economic well-being and payout use?
 - d) What are efficient risk-pooling groups for death-related risks?

NATURAL DISASTERS

Over the past decade, the frequency of natural disasters has surged globally (World Meteorological Organization, 2021). These events are the most common shocks affecting households across the majority of contexts studied by Heltbert et al. (2014). The human and financial toll of disasters is far from evenly distributed. In small island states and LMICs, natural disasters can inflict damages exceeding an entire year's GDP, and this is also where three-quarters of disaster-related deaths occur (World Bank, 2014). Preparedness for such events remains critically low, particularly in LMICs. Over the last 30 years, only 3 percent of disaster management funding has been allocated to non-emergency measures (ibid.), meaning that risk realization is all the more costly, and leaves countries exposed to high costs following a disaster. When considering the uneven human and monetary costs, in addition to the lack of protection against risk, it is all the more striking that the ratio of insured to total losses is only one-half in the US, and one-fiftieth in China (World Bank, 2014). This review will answer two questions: *What are the reasons behind low take-up for natural disaster insurance? When it is taken up, does natural disaster insurance generate impact?*

Natural disasters include droughts, floods, tropical storms, and earthquakes (World Bank, 2014). In her excellent review of natural disaster insurance, mostly in HICs, Kousky (2019) defines natural disasters through what makes them intrinsically hard to insure: losses are systemic and extraordinarily high-value by nature; expected losses are uncertain; and post-disaster aid mechanisms can create consequential moral hazard. These challenges limit the market to actors capable of bearing systemic risks, such as reinsurers, governments, and large private entities. Kousky (2019) explores the resulting insurance market structure in the US and select European countries in her review. Challenges to insuring these markets often limit research on the impact of natural disaster insurance to post-shock data, hypothetical surveys, or macroeconomic analyses (Kousky, 2019). We will aim to identify opportunities for experimental research to address these knowledge gaps, without having to design, fund, and distribute natural disaster insurance products. At the same time, as the world increasingly focuses on a “just transition” and helping those most affected by climate change to manage risks, we anticipate many opportunities for such research collaborations to take place.

TAKE-UP

In a choice experiment in Vietnam, Reynaud, Nguyen, and Aubert (2018) find that when households are offered multiple flood insurance options across price and coverage levels, one-quarter consistently chose to remain uninsured. Supporting this trend, Kousky (2019) estimates using Swiss Re Institute data that over 70 percent of natural disaster losses globally go uninsured. We will explore the drivers of this low take-up, focusing on supply-side constraints, the appeal of insurance products to consumers, and behavioral factors, including the role of climate education.

Supply-side: volume of shocks, adverse selection

To be classified as a natural disaster, an event usually needs to exceed an ad hoc or pre-specified threshold. Their severity and systemic impact can deter market participation: Many potential actors avoid the market altogether, and even private insurers may withdraw after major events (Kousky, 2019). Risk pooling across countries can decrease both average premiums and the risk of fund ruin in the face of systemic shocks, which Awondo (2019) shows in the context of the African Risk Capacity, an African Union agency pooling risk at the multinational level to deliver index insurance.

Product fragmentation: Given the magnitude and complexity of these risks, protection is fragmented across multiple actors and delivery mechanisms (e.g., public programs, private insurance, humanitarian aid, disaster bonds, and NGO aggregators), with added complexity coming from the fact that each product might cover only one dimension of a multidimensional risk (e.g., flood and wind damage in hurricanes). This fragmentation generates a risk of cannibalization among products, with new offerings potentially displacing existing ones rather than expanding coverage, which may discourage innovation. A critical question is whether alternative distribution methods, such as bundling protective measures with insurance, could reduce costs and improve uptake.

Ex-post disaster aid, Samaritan dilemma, and moral hazard: The market is also shaped by the existence of significant ex-post aid, which can *reduce demand for* ex-ante solutions. Deryugina (2017) estimates state- or privately-delivered help for well-known disasters, such as the Haiti earthquake, to be in the billions. Deryugina (2017) states that in the case of the US, in the ten years following a hurricane, an affected county receives extra transfers through non-disaster social insurance programs, averaging about US\$780–US\$1,150 per capita in present value. This dynamic creates a moral hazard, where individuals will be less likely to privately invest in risk management like insurance or protection. It also could distort political incentives, as governments may prioritize post-disaster relief, which is often more politically visible than pre-shock insurance or prevention. Research in Mexico, for example, shows that pre-election indemnity payments boost incumbent party votes by 8 percent (Fuchs and Rodriguez-Chamussy, 2011, cited in de Janvry, 2015), highlighting the electoral incentives for reactive rather than proactive policies.

Affordability and coverage of products

Affordability remains a major barrier to natural disaster insurance uptake, particularly among vulnerable households. Expensive policies can both result from and exacerbate adverse selection, creating a vicious cycle: In the US, for example, half of uninsured households in 100-year floodplains are classified as poor by the Department of Housing and Urban Development (FEMA 2018, cited in Kousky et al., 2021). In some cases, mandatory insurance schemes break this cycle by eliminating adverse selection risks. Flat premium rates across levels of exposure, spreading costs from high-risk to low-risk areas, further help redistribute risk (Kousky, 2019). Where insurance is voluntary, however, innovative solutions are emerging. Kousky et al. (2021) assess the feasibility of index-based microinsurance in the US. Through reduced verification costs and lower coverage rates against disaster-driven losses, microinsurance can offer lower premiums and constitute a promising option for low-income households. Testing and adapting such models in low-income countries could open valuable new avenues for research and policy.

Multidimensional damages, complexity, and basis risk: Natural disasters have many determinants and entail many different types of expenses, such as property, agricultural land and associated income, or health. This complexity makes insurance design challenging, as it increases basis risk (i.e., the likelihood that, in index insurance, payouts do not align with the specific damages suffered). For example, during Hurricane Katrina, traditional homeowner insurance covered wind damage but excluded flooding (Gallagher and Hartley, 2017), leaving many losses uncompensated. Empirical evidence from Vietnam underscores this challenge: Households faced health expenses, agricultural losses, and property damage from natural disasters, yet their willingness to pay for insurance varied sharply by risk type. Households were far more willing to insure against health risks than other flood-related consequences (Reynaud, Nguyen, and Aubert 2018). This mismatch, combined with the availability of alternative coping strategies, can

suppress overall demand for insurance. The authors propose multidimensional insurance products as a potential solution, an area ripe for further research.

Behavioral biases and climate education

In Vietnam, Nguyen, Reynaud, and Aubert (2018) find that most households believe floods are going to become less frequent, contrary to scientific predictions. Multidimensional behavioral biases can further impede protection from natural disaster risk. Studying flood-prone areas of Portland in the US, Kousky and Netusil (2019) find that floodplain residents are likely to only learn about their risk after making an offer on their home, to purchase insurance only because of federal requirements, to underestimate their risk of experiencing floods, and to perceive their premiums as unfair. Ignoring natural risk management altogether can be encouraged by the fact that aid often follows large disasters. However, increased risk awareness can provide an opportunity to create impact. In the wake of a disaster, risk awareness surges, creating a prime moment to introduce long-term insurance in markets where adoption is typically low—and push for risk mitigating or adapting behaviors, making insurance cheaper. More research on how climate education can increase awareness and acceptability of insurance requirements is needed. Additionally, changing the identity of the insuree to more sophisticated actors like states (Awondo, 2019, del Valle et al 2022) or lenders (Collier, 2020) can be a good opportunity to circumvent take-up barriers that are related to financial education or behavioral biases.

Take-up rates for natural disaster insurance remain stubbornly low. The *World Development Report 2014* highlights that high adoption occurs only in two scenarios: immediately after a disaster or when insurance is mandatory. The challenges of low demand, compounded by the high costs of covering large-scale, correlated risks, have discouraged research into the impact of microinsurance for natural disasters. This review argues that significant opportunities exist to address these barriers, either through boosting take-up by mitigating key obstacles and comparing innovative solutions to traditional tools like subsidies, or by enhancing the value of existing products to better meet customer needs and drive adoption.

IMPACT

De Janvry (2015) proposes a conceptual framework linking financial risk-management tools to economic development in the context of disaster risk. This framework highlights how insurance can theoretically influence risk reduction, risk management, and shock coping, all of which are shaped by willingness to pay and political priorities. We draw from this framework, also noting that insurance products can evolve over time and that what is crucial to building the narrative on insurance is reflecting on how to improve already-existing products. We document impacts on financial resilience, moral hazard, and note product design challenges that keep insurance from delivering impact. We explore these dimensions below, noting that de Janvry's (2015) observation that rigorous research quantifying these relationships remains scarce—now more than ten years old—still holds.

Financial resilience

Evidence from developed countries demonstrates that insurance payouts significantly enhance resilience to shocks. Kousky (2019) points to evidence that insured households are 37 percent more likely to rebuild their homes after a disaster in the US. Low-income households are more likely to be uninsured, and because of pre-existing financial vulnerability, their coping strategies (e.g., taking on extra work or falling behind on debt payments) are more likely to jeopardize their financial health. After Hurricane

Harvey, for example, uninsured low-income households were less likely to report that insurance helped cover their expenses and more likely to default on their credit card (Hamel et al., 2018, cited in Kousky et al., 2021). This is not restricted to individual resilience, as communities with more insurance coverage are also more likely to maintain small business visitation after a natural disaster in the US (Kousky and You, 2024). As such, delayed or absent financial relief can trigger long-term economic stagnation by discouraging future investment in disaster-hit areas, a dynamic that de Janvry (2015) argues undermines the full potential of insurance to foster recovery and growth.

Moral hazard

The gravity of natural disasters means that any moral hazard related to insurance can have deadly consequences. Experiences of disaster and aid may reshape risk preferences: Reynaud and Aubert (2019) demonstrate that exposure to floods or receipt of aid alters how individuals perceive both gains and losses in experimental settings. This aligns with the *World Development Report 2014*'s “paradox of protection,” where prolonged loss suppression from frequent events erodes vigilance and risk awareness. Yet real-world evidence remains inconclusive. Kousky (2019) finds no definitive proof that the expectation of disaster aid inherently discourages proactive risk management, leaving room for nuanced solutions. Some experts advocate for incentivizing risk mitigation, such as reducing insurance premiums for households adopting protective measures (Kousky, 2019). However, the lack of rigorous cost-benefit analyses comparing the cost and risk protection performances of these approaches hampers the scalability of such initiatives.

Challenges to generating impact: delays, undercoverage, and third-party effects

Disbursement delays Even where natural disaster insurance exists, its effectiveness can be undermined by disbursement challenges, with timing emerging as a critical issue. Kousky et al. (2021) demonstrate that delays in payouts disproportionately harm low-income households in the US, as their limited financial reserves force them to bear immediate expenses, leading to significant emotional and physical distress. Research on humanitarian aid delays further suggests that slow disbursements may impair children's long-term development during critical periods (Banerjee et al., 2024). Beyond financial strain, dissatisfaction with insurance processes can erode demand, exacerbate adverse selection, and reduce overall coverage. The rise of index insurance offers a promising solution to accelerate payouts post-disaster. Kousky et al. (2021) analyze its potential in the US, comparing delivery modes—such as community-based aggregators, mobile apps, public programs, or bundled products—each with distinct trade-offs in cost and efficiency. However, more research is urgently needed to assess how index insurance performs across diverse contexts, its impact on customer value, and its contribution to development outcomes, particularly for vulnerable populations in both HICs and LMICs.

Insufficient disbursement and third-party effects: Many households, especially the most vulnerable, perceive a mismatch between insurance and actual needs. For example, 50 percent of individuals perceive an inadequacy between actual losses and insurance payments in New Zealand (Poonitirakul et al., 2017). Underinsurance is equally pervasive: CoreLogic (2017, cited in Kousky, 2019) found that 60 percent of homeowners lack sufficient coverage to fully rebuild their homes. In the US, Deryugina (2017) found that only 25 percent of disaster losses are covered by insurance payouts. Compounding these challenges, third-party dynamics such as lender influence can further divert payouts away from resilience. After Hurricane Katrina, Gallagher and Hartley (2017) observed that in the most severely flooded areas home

debt plummeted, with a quarter of mortgaged residents effectively using insurance funds to repay lenders rather than rebuild. This undermined the effect of natural disaster insurance on financial resilience of the insured, perhaps to the advantage of lenders. This was caused by institutional features, payouts being paid to both homeowners and lenders, with anecdotal evidence suggesting lenders were holding payouts until borrowers reimbursed their home debt. The results underscore the need for closer scrutiny of how institutional frameworks shape third-party mediation effects. Analyzing policy choices across insurers in the US, Collier (2020) provides suggestive evidence that insurer identity, notably the commission rate, is correlated with the likelihood that a household over-insures. Beyond coverage mismatches, how relief funds are allocated between rebuilding, debt repayment, or local investment can profoundly influence resilience, labor markets, and neighborhood viability. Modern financial data offers opportunities to explore these dynamics in a broader economic context. Additionally, older studies cited in Kousky (2019) hint at disparities in claims processing based on income, education, and race, suggesting a pressing need for updated research to uncover and address these inequities with contemporary data.

Innovations in humanitarian aid delivery, such as mobile money transfers deployed after Rwanda's 2008 earthquake and Mexico's Fonden program, which uses pre-specified disaster thresholds (del Valle, de Janvry, and Sadoulet, 2020, cited in Banerjee et al., 2024), offer promising models for improving insurance processes. These examples highlight opportunities for collaborative research between academics and insurance providers to refine and scale effective solutions. Digitization, in particular, presents a powerful technological foundation to explore and expand these advancements.

CONCLUSION

Natural disasters are highly costly events that affect multiple dimensions of customers' lives at once. Such events are also highly visible, which can trigger responses from national and international entities. As such, demand for protection from the impacts of natural disasters falls into different categories, including mitigation products that tackle the many dimensions affected by natural disasters (e.g., property, crop, motor, or health insurance), but also non-insurance products, and can be undermined by the expectation of ex-post aid. The severity of natural disasters also means that research experimentally providing insurance can be very costly if researchers are designing and distributing products, which can explain the underrepresentation of experimental research into this risk. As such, most of what we know about natural disaster insurance products comes from quasi-experimental studies of compulsory products—pointing to positive effects on financial resilience both at the individual and community levels from spillovers.

In this section, we have identified many barriers hindering demand for these products—customer education, behavioral biases, price, and supply. Importantly, we have also identified barriers to generating impact from products that are already taken up, including conflicting incentives between customers and third parties such as lenders, disbursement speeds, underinsurance and mismatch of coverage to needs, and the risks for customer protection of compulsory insurance products. Research on the effects of encouraging enrollment or improving insurance products on demand and impact is not only feasible, including through randomized evaluations, but also urgently needed in the face of increasingly severe natural disaster risk.

OPEN QUESTIONS

1. Investigating under-documented risks
 - a) Solving for the research gap: can the co-existence of several potential scales and delivery modes provide researchers with opportunities to test interventions without having to implement these products themselves?
 - b) Documenting effects on under-covered segments: -how should we design products for customers who face risks on different margins (e.g., self-employed workers), who could lose their income-generating assets at the same time as incurring an increase in expenses?
2. Increasing take-up to investigate new outcomes: interventions and design
 - a) What are the effects of various interventions on take-up?
 - i. Customer education (climate change awareness, insurance)
 - ii. Price (subsidies, paying premiums when the customer has the most liquidity)
 - iii. Could interventions that have been documented in other types of insurance (e.g., insurance at the community level) also show promise for natural disasters?
 - iv. Product design (flexibility on risks covered, coverage rate, and/or trigger)
 - v. Nudges (present bias, difficulty thinking about low probability events, inattention)
 - vi. Third party incentives (e.g., voter support for insurance programs compared to costlier, but potentially more popular post-disaster aid)
 - vii. Basis risk — products that take into account several risks (e.g., flood and wind) and several damage types (e.g., assets and health expenses).
 - b) What is the comparative performance of different co-existing delivery modes (e.g., mobile app, bundled with other products, delivered through a local aggregator or a public program (Kousky, 2021)—in terms of targeting, value addition (e.g., time of disbursement, customer satisfaction, discrimination), coping mechanisms (e.g., debt, labor, asset sales, migration or eviction) and long-term development? This entails building more evidence on the cost and distribution of risk, especially for non-US contexts.
3. Measuring impact: insurance's contribution to development outcomes
 - a) What is the performance of insurance as a risk management tool for natural disasters?
 - i. When insurance is acquired, what effect does it have on moral hazard: — location in disaster-prone areas and acquisition of protective infrastructure?
 - ii. How effective are premium discounts or other incentives from insurance companies in driving consumers to engage in ex-ante protective strategies?
 - iii. What is the effect of natural disaster insurance on other forms of insurance or aid such as health, unemployment, and disability insurance or humanitarian aid disbursements?
 - iv. What are the larger-scale effects of interventions that increase resilience to natural disasters once local labor markets, community amenities, and other larger-scale effects are taken into account?

- v. What can be said through the quantification of these interlinkages about the welfare effects of natural disaster insurance? What can be said about mortality, local economic growth, and development outcomes?
- b) Insurance in the broader protection system:
 - i. What is the effect on the affordability of insurance when bundling insurance with protection infrastructure?
 - ii. How does natural disaster insurance interact with protective strategies, other forms of insurance, and non-insurance risk management products (e.g., health, unemployment, or disability insurance, humanitarian aid)?

CONCLUSION

The frequency and gravity of risks are increasing, and vulnerable households generally have fewer risk mitigation tools at their disposal, in particular insurance, to face those risks in a sustainable manner. The nature of risks themselves influences choices around mitigation, and catastrophic (e.g., death) or hard-to-quantify (e.g., natural disasters) risks might induce inaction. In addition, different types of risks interact differently with insurance markets. They vary in the extent to which people can self-insure against them and in their frequency, with rarer events offering fewer opportunities for product improvement and for customers to revise their beliefs. Thus, there cannot be a “one-size-fits-all” answer to the question of the impact of inclusive insurance.

That said, across all documented risks, insurance products with good product design and well-functioning processes are documented to have positive impacts on financial resilience, costly coping mechanisms, and positive spillovers to their networks. Importantly for welfare analysis and policymaking, these effects go beyond the insured into their networks, families, and businesses, and surpass the effects of same-price policy instruments that are independent of risk like cash grants.

However, across almost all risks, many products researched face low demand at, and sometimes below, actuarial prices. In many cases, close examination of product conditions or how they are delivered set them apart from customer centricity, or “inclusive insurance”. While highlighting the necessity for researchers to go under the “insurance umbrella” into precise product characteristics, in some settings, no counterfactual well-designed product is available. The important question (rather than “*does insurance work?*”) then becomes: *Is it possible to create and distribute inclusive insurance products across all risks—regardless of their frequency and gravity—and across all settings—especially considering service or product supply conditions, infrastructure, and institutional environments?* This question is crucial for narrative building, government involvement, and further research around insurance.

Across risks and settings, interventions that make products cheaper, simpler, and of higher quality exist and have successfully generated higher take-up rates and impact, giving the field reasons to be hopeful. Subsidies have been shown in many contexts to yield—and even be necessary conditions for—higher take-up rates, for health and agricultural products in particular. Subsidies, however, are not a panacea: In instances involving multi-dimensional barriers, such as health insurance in rural areas, they may not work. In other cases, like with agricultural insurance or with voluntary funeral insurance, working around the seasonal incomes of farmers can be much more efficient. Good opportunities exist to make insurance cheaper without having to subsidize it. These can notably come from technological innovations, as shown by new work redefining insurance zones for index insurance, or new ways of offering flexibility around payment timing in areas where enforcement capacity is limited. There have also been positive results from interventions making insurance easier to understand, enroll in, or claim. This is especially the case with complicated products such as index or health insurance. When a service is delivered, such as in health insurance and in some cases natural disaster insurance, interventions aimed at increasing the quality of that service or the claiming process have shown promise, in particular when populations are experiencing insurance for the first time and have low trust or experience with it. While the presence of adverse selection has been documented, research that tried to address it through other

means than by making insurance better, simpler, and cheaper usually encounter very limited number of enrolled to work with.

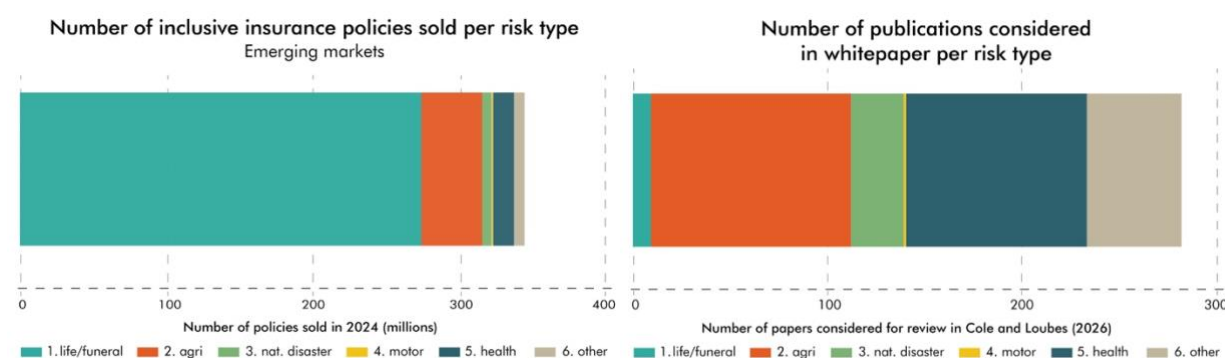
Finally, while demand is a barrier to insurance impact, many issues can hinder the impact of an insurance product even when it is taken up. Although the primary coping mechanism differs for each risk, common to any risk is the importance of third parties in mediating said impact. Healthcare providers, insurance sellers, politicians, banking institutions choosing to lend to farmers or homeowners, and partners ensuring the delivery and disbursement are key in mediating the impact of insurance directly through utilization and indirectly through trust and experience effects. Research on the impact of third parties and interventions changing their incentives is needed for all products. Beyond third parties, we encourage any research on product improvement among products that have already reached scale, in particular as it allows for the measurement of endline outcomes and can represent a more feasible and policy-relevant alternative to research developing and distributing products from scratch.

RESEARCH AGENDA

The whitepaper provides recommendations for particularly promising research areas.

Perhaps first on the list is to promote research in entirely uncovered segments. There is almost no evidence on the value, importance, or even feasibility of insurance and other risk management tools for the non-farm self-employed sector. Self-employment is the most prevalent working arrangement in the world, but individuals so engaged cannot benefit from economies of scale, risk-pooling, and transaction cost reductions associated with workplace-provided insurance. A further barrier may be formality requirements for insurance, which some business owners may prefer to avoid. However, given that many events represent both income-decreasing and expenditure-increasing risks for the self-employed—this can be the case with a health shock, a car accident, or a fire in one's home, for example—this is a population for which insurance may have a particularly high value. Here, the emergence of gig economy platforms and digitization may offer promising collaborative opportunities for future research.

Several risks that form an important part of inclusive insurance portfolios are also absent from research. Although we do not dedicate subsections to them, we outline them as key areas for future research and refer to several reviews on their impact in the non-inclusive insurance space. Auto insurance is one of them, with especially heightened stakes for the self-employed and gig economy workers for whom cars and bikes enter the income-generating process. Sun and Yannelis (2016) and Kluender (2024) provide recent contributions to this literature—in particular, Kluender (2024) shows positive experimental results of selling smaller units of insurance for auto (pay-as-you-go) on the enrollment rates and effective coverage for lower-income drivers in the United States. Building on these insights to extend the auto insurance literature is needed. Credit-linked life and accident insurance is also a considerable part of insurers' portfolios (see Figure 1), but little covered by research (Annan, 2022, Bauchet and Morduch, 2019). We also have very little evidence about coverage for other risks, such as fire, property, theft, or crime, or for under-documented risks like life, funeral, and natural disaster insurance.



Source: *Landscape of Microinsurance 2024* and authors' calculations.

Figure 1: Life, funeral, and other risks featured in vulnerable customers' inclusive insurance portfolios are under-represented in the economic literature

Second, we stress that a challenge to this type of research is related to the persistently low take-up of some products. We encourage the examination of new interventions that could allow for the examination of outcomes beyond take-up, as well as the use of documented ways of increasing enrollment. Although we display the cross-thematic points here, we encourage readers interested in promising risk-specific innovations to consult the research agendas dedicated to each risk.

The third section of the general research agenda relates to measuring impacts on welfare, and especially longer-term outcomes. Although we have some evidence of the positive impacts of insurance on some variables—financial resilience, mortality, peace of mind, and depression, among others—the general level of evidence on longer-term development impacts along several important margins is scant. Even scarcer is information about particularly vulnerable populations, or how insurance interacts with factors such as age, education, origin, gender, or occupation. Finally, it is important to stress that insurance is not a homogeneous product, nor does it exist in a vacuum: Questions around the comparison and combination of insurance products within a risk, across product designs, across risks, and that of insurance with other financial inclusion or risk mitigation tools are important issues for governments and households with limited budgets. The impact of insurance beyond the insured, on local labor markets, family networks, and financial systems also deserves more investigation.

- 1) Bridging the research mismatch: Under-documented risks and segments
 - a) Under-documented risks: property, life and funeral, crime, motor, fire, credit-bundled products
 - b) Under-represented segments: low-income households, in particular self-employed workers
 - c) Heterogeneity in the effect of insurance — impact across gender, age, education, etc.
- 2) Increasing take-up to investigate new outcomes — using successful interventions and design
 - a) Assessing cost-effective interventions to increase take-up
 - i. Customer / seller training
 - ii. Redefining index insurance to reduce basis risk
 - iii. Making indemnity cheaper

- iv. Digitization to reduce distribution costs, as well as to reduce claims handling costs, and potentially to prevent fraud
 - v. Making insurance more tangible, e.g., immediate value creation for the customer, bundling with other products, etc.
 - b) Good take-up beyond high take-up
 - i. How can incentives between third parties and consumers be aligned to ensure demand for insurance is targeted toward products that serve customers' best interests?
 - ii. What is the role of LLMs and other ICT interventions in reducing the cost of providing product education, helping customers make optimal policy selection choices, and increasing the speed and accuracy of claims processing?
 - c) Researching scalable products
 - i. How can we document the quality of products in a systematic way?
 - ii. How can we ensure products designed with impact outcomes in mind have the potential to generate enough take-up to enable research?
- 3) Measuring impact — insurance's contribution to development outcomes in a policy perspective
- a) Tackling development outcomes
 - i. Which insurance products contribute to which development outcomes? For which populations? For example, CGAP's Impact Pathfinder includes women's economic empowerment, climate change mitigation, climate resilience and adaptation, jobs and entrepreneurship, access to essential services, economic growth, financial stability/health, and poverty reduction. Studies that seek to investigate these outcomes will have better chances of being able to observe them by relying on documented means of increasing take-up, such as subsidies, outreach, or payment flexibility, as outlined in section-specific research agendas.
 - ii. Which insurance products should be prioritized for different segments and development outcomes?
 - b) Insurance beyond the insured: what is the effect of insurance beyond the insured, i.e., on their families, employees, lenders, and at the macro level? How does insurance complement or substitute coping strategies with other financial services or informal networks?
 - c) Insurance within the risk protection policy toolbox: What is the cost-benefit effect of bundling insurance with protection or other risk management tools? In what contexts can it help with barriers to market consolidation? What are the comparative effects of insurance and other social protection or risk mitigation tools, e.g., cash transfers, credit, etc.?

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