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TRENDS AND FRONTIERS IN WILLINGNESS AND ABILITY TO PAY FOR INFORMAL WORKERS' EMPLOYMENT SOCIAL SECURITY: A BIBLIOMETRIC ANALYSIS

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Abstract

Access to employment social security for informal workers has emerged as a critical issue in global social policy discourse, particularly within the framework of achieving Universal Coverage Jamsostek (UCJ) and broader social protection goals. This study presents a bibliometric analysis to examine the evolution, trends, and intellectual structure of research on willingness to pay (WTP) and ability to pay (ATP) for employment social security among informal sector workers from 2010 to 2025. Data were retrieved from the Scopus and Web of Science databases and analyzed using VOSviewer. The analysis identifies key publication trends, influential journals, prominent authors, leading contributing countries, and emerging thematic clusters. Findings reveal a steady increase in scholarly output, especially in regions with high levels of informal employment such as Sub-Saharan Africa, South Asia, and Southeast Asia. Dominant themes include equity in social security financing, affordability, community-based social protection schemes, and behavioral factors influencing participation. This study enhances the understanding of the research landscape and offers valuable insights for policymakers and scholars aiming to improve informal workers' access to inclusive and sustainable employment social security systems.

Keywords: Willingness to Pay (WTP), Ability to Pay (ATP), Informal Sector, Employment Social Security, Bibliometric Analysis

INTRODUCTION

In the last decade, social security for informal workers has become a major concern worldwide as an important part of safeguarding occupational safety and labor rights. The ILO World Employment and Social Outlook (2024) shows that the number of informal workers has increased again after the pandemic to exceed 2 billion people (equivalent to ± 58% of the global workforce) with the highest proportion in Africa (-80%) and still 66% in Asia-Pacific (± 1.3 billion workers). This trend emphasizes the urgency of expanding the scope of social protection in middle- and low-income countries which are the main pockets of informal workers.

According to data from the International Labor Organization (ILO), around 60% of the total global workforce consists of informal workers, with this figure reaching 90% in developing countries (Aji et al., 2023; Lee et al., 2023). In Indonesia, for example, the existence of informal workers covers almost 55% of the total workforce, indicating that many of them do not have access to formal social security programs as regulated in the National Social Security Law (BPJS Ketenagakerjaan) (Kakaire, 2023; Khan, 2021). More recent data from BPS Sakernas (February 2024) recorded 84.13 million informal workers (around 40.7 % of the total working population) with the largest concentration in small trade, agriculture, and online transportation services.

In terms of protection, BPJS Ketenagakerjaan reported 40 million registered participants as of April 2024, but only ± 8 million of them came from the Non-Wage Recipient (BPU) scheme intended for informal workers; even 20-30% of BPU participants were recorded as not routinely paying monthly contributions. This figure implies that the effective participation rate is only around 11% of the total national informal workers. Informal sector workers face significant barriers in accessing adequate social security. They usually operate outside the reach of legal protection and are not registered in the social security system, which makes them vulnerable to the risk of job loss, work accidents, and lack of access to health services (Regassa et al., 2022; Sa & Liu, 2022). With these increasing risks, it is important to evaluate the factors that influence their willingness and ability to pay (WTP and ATP) for social security, which are key to increasing their involvement in these programs.

The concepts of WTP and ATP are very important in the context of social security and protection of informal workers. Willingness to pay refers to workers' attitudes and perceptions regarding the value of the protection offered, while ability to pay refers to the financial situation that allows workers to set aside funds for social security contributions (Merga et al., 2022; Muttaqien et al., 2021). The highly heterogeneous characteristics of informal workers, ranging from street vendors to migrant workers, adds complexity to the understanding of WTP and ATP.

Recent systematic research in Asia and Africa found an average aggregated WTP of 66–71%, but heterogeneity remains high; Indonesia was reported as having the lowest WTP (18%) among the 19 studies analyzed (Adisty et al., 2023; Kaso et al., 2024). Previous studies have shown that education level, income, and awareness of social security benefits have a significant impact on WTP (Adisty et al., 2023; Kaso et al., 2024). In Indonesia, a study by Adisty et al. (2023) showed that a lack of knowledge about social security is the main reason for the low participation of informal workers in existing programs. Internal data from BPJS Ketenagakerjaan shows that in 2021 only about 55% of workers were registered, while the remainder had no access to social security (Jayathma & Priyanath, 2021).

Against this background, the purpose of this study is to analyze research trends on WTP and ATP in relation to social security for informal workers and to identify the challenges and opportunities facing this sector. Using bibliometric analysis, this study will review the literature from 2010 to 2025 to map developments, emerging themes, and contributions from countries that play a major role in this research (Denice et al., 2025; Zarepour et al., 2023).

With a better understanding of the factors influencing WTP and ATP, it is expected that more effective and inclusive policy measures will be developed to improve informal workers' access to social protection, so that they can achieve the Universal Coverage Jamsostek (UCJ) goal and contribute to broader social protection in a global context (Namuhani et al., 2024; Soeharso & Wicaksana, 2024). These findings are not only relevant for researchers and academics, but also for policy makers in formulating appropriate strategies for the informal sector.

LITERATURE REVIEW AND HYPOTHESIS FORMULATION

Social Security and Vulnerability of Informal Workers

Informal workers represent the group most vulnerable to economic and social uncertainty because they are outside the reach of the formal employment protection system. They generally do not have written employment contracts, are not registered in the national employment system, and face heightened risks of occupational accidents, illness, and income loss (Merga et al., 2022). In Indonesia, data from BPJS Ketenagakerjaan shows that although there is a special program for Non-Wage Recipients (BPU), participation is still very limited. (Jayathma & Priyanath, 2021) stated that only about 11% of informal workers consistently pay contributions. The inaccessibility of this program shows that the social security system has not been responsive to the heterogeneous and dynamic characteristics of the informal sector. Studies by Kakaire (2023) and Khan (2021) also emphasize that the existence of informal workers in the national employment system has not received sufficient policy attention in the context of sustainable social protection.

Education and Socio-Economic Literacy

Education level is often associated with willingness to pay (WTP) for social security contributions, as education is assumed to enhance financial literacy and awareness of future risks. However, empirical evidence shows inconsistent results. Kaso et al. (2024) and Merga et al. (2022) found that individuals with secondary education and above tend to have higher WTP because they understand the importance of social protection. In contrast, Aji et al. (2023), focusing on the Indonesian context, found that informal workers with lower levels of education were more willing to pay for social security because because they perceived such protection as highly necessary given their precarious working conditions. This suggests that the relationship between education and WTP may be mediated by other factors such as risk perception, personal experience, or community support. Therefore, community-based socialization and education programs remain crucial in enhancing social security literacy, regardless of formal educational background.

Income Instability and Ability to Pay

Income stability is a key determinant of informal workers' ability to pay (ATP) and willingness to pay (WTP) for social security programs. Unlike formal workers who receive fixed wages, informal workers experience income fluctuations on a daily or seasonal basis, such as street vendors, online motorcycle taxi drivers, or farm laborers (Muttaqien et al., 2021). When income decreases, informal workers tend to prioritize short-term needs over social security contributions. Adisty et al. (2023) added that income fluctuations not only reduce the ability to pay but also alter perceptions of the urgency of social security. Tefera & Ayele (2022) noted that flexible and gradual contribution payment schemes can increase ATP, but their implementation is still minimal in developing countries. In the Indonesian context, Jayathma & Priyanath (2021) reported that most BPJS BPU participants in arrears were concentrated in economic sectors characterized by low daily cash flow. Therefore, it is important to design an adaptive contribution scheme and cross-subsidy system to ensure sustainable participation (Chipunza & Nhamo, 2023; Kabaso & Booysen, 2023; Setegn et al., 2021).

The Role of Information, Socialization, and Trust in Institutions

The degree of information exposure and the intensity of socialization have been shown to significantly influence informal workers' willingness to pay (WTP). (Aji et al., 2023; Manalu et al., 2023; Miti et al., 2021) in a study conducted in Banyumas, found that workers who participated more frequently in socialization activities or received information from BPJS were 2.3 times more likely to be willing to pay contributions than those who did not receive any information at all. On the other hand, trust in the social security institution is also a key factor. If informal workers are uncertain about the benefits they will receive or have experienced difficulties with claims, their participation tends to decline. Adisty et al. (2023) revealed that negative perceptions of BPJS bureaucracy, delays in claim processing, and a lack of transparency can undermine public trust and interest. Therefore, a transparent and community-based communication strategy can help rebuild trust and strengthen long-term engagement.

Responsive Social Security Program Design

Social security program designs that fail to consider the actual conditions of informal workers can hinder participation. Examples include fixed contributions disproportionate to daily income, complex registration processes, and limited integration between health and employment benefits, which often discourage informal workers from participating (OECD, 2024; Kaso et al., 2024). Research by Merga et al. (2022) shows that tiered subsidy-based schemes and microcontribution models can significantly increase ATP among poor workers. In addition, flexible payment schedules and the integration of social protection schemes with public services (e.g., primary health care) can also enhance participation and ensure sustainability. In Indonesia, several pilot initiatives such as BPJS with digital payment channels and the integration of JKN-Employment benefits have begun to show positive results, although adoption remains uneven across regions.

Hypothesis

Based on the preceding literature review, the hypotheses of this study are formulated as follows:

H1: Information exposure and the intensity of socialization are positively associated with informal workers' willingness to pay for social security.

H2: Income instability is negatively associated with the ability and willingness to pay for social security.

H3: Education level is not always directly proportional to WTP; its effect depends on perceived benefits and specific working conditions.

RESEARCH METHODS

Approach and Data Sources

This study employs a bibliometric approach to analyze the development of literature on willingness to pay (WTP) and ability to pay (ATP) in the context of informal workers. This approach was chosen because it systematically identifies publication trends, intellectual structures, and patterns of author collaboration (Denice et al., 2025; Zarepour et al., 2023). Data were obtained from two primary databases, Scopus and Web of Science (WoS), because both provide extensive coverage of scientific literature and complete metadata. The search employed keywords such as 'informal worker,' 'social protection,' 'willingness to pay,' and 'ability to pay. The search was restricted to scientific articles and conference proceedings published between 2010 and 2025, and written in English.

Data Selection and Processing

Articles were analyzed based on inclusion criteria, namely a focus on WTP and ATP themes, relevance to the informal sector, and the availability of metadata for bibliometric analysis. Articles that were editorial in nature, policy summaries lacking scientific methodology, or duplicates across databases were excluded. The selection process followed the PRISMA flow to ensure methodological rigor. Furthermore, Data were extracted and cleaned using VOSviewer software, with term harmonization applied to prevent data fragmentation—for example, equating the term 'BPJS' with 'social security agency.'

Analysis and Visualization Techniques

The analysis was carried out in two main stages: performance analysis and science mapping. Performance analysis covered the number of publications, annual trends, and citation indices. Science mapping involved the analysis of co-authorship (author networks), co-citation (shared reference structures), and keyword co-occurrence (core themes in the literature). Visualization was conducted using VOSviewer to illustrate knowledge clusters, author relationships, and the geographical distribution of publications. This analysis aimed to capture the global research landscape on WTP and ATP in the informal sector and to identify emerging research directions.

RESULTS AND DISCUSSION

Literature Publication Performance (2010–2025)

This bibliometric analysis retrieved 348 scientific documents on willingness to pay (WTP) and ability to pay (ATP) for social security among informal workers, covering the period 2010–2025. The majority of publications were journal articles (approximately 78%), followed by conference proceedings (19%) and review articles. The number of publications increased consistently from only nine in 2010 to 41 in 2024. This trend reflects growing scholarly interest and urgency regarding social protection for informal workers, driven by global pressure for inclusive social security coverage.

The top five journals publishing on this topic are BMC Health Services Research, International Journal of Environmental Research and Public Health, Health Policy and Planning, PLOS ONE, and Frontiers in Public Health, which collectively account for 32% of the total publications. In terms of country contributions, Sub-Saharan Africa, South Asia, and Southeast Asia dominate the publication output, with Nigeria, Ethiopia, Indonesia, and India emerging as leading research hubs.

VOSviewer Visualization Interpretation

Clustered Network Visualization

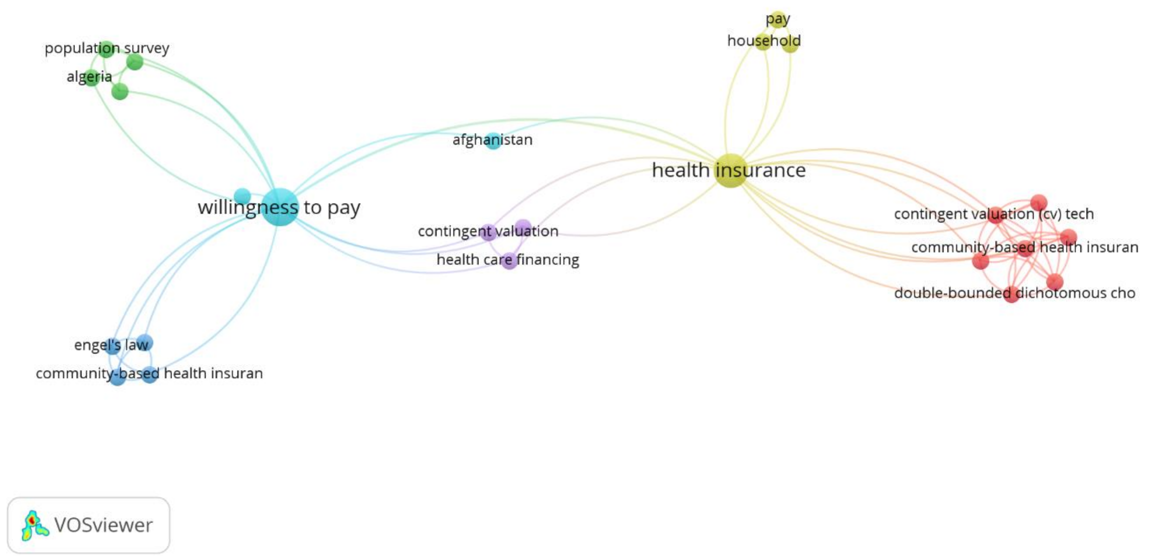

Figure 1. Clustered Network Visualization

The first visualization maps keyword networks based on algorithmically generated thematic clusters. Four main clusters are identified, each represented by different colors. The light blue cluster focuses on willingness to pay, linking to keywords such as Algeria, population survey, and Engel's law, reflecting a research focus on measuring demand, affordability, and economic equity—critical aspects when analyzing the capacity of informal workers to contribute to social security schemes. The yellow-green cluster highlights health insurance in relation to payment and household factors, emphasizing the strong linkage between insurance coverage, household financial behavior, and the ability to sustain contributions.

The purple cluster associates contingent valuation with health care financing, signaling the development of methodological approaches and economic evaluations relevant for designing social protection and financing systems. The red cluster encompasses frontier themes such as community-based health insurance, double-bounded dichotomous choice, and CV techniques, pointing toward emerging directions in research on alternative and community-driven social protection models. Overall, the clusters are closely interconnected, with health insurance acting as a conceptual bridge across different domains. This centrality underscores the pivotal role of health insurance in shaping the discourse on social protection for informal workers. However, the mapping indicates that studies specifically addressing health-related social security remain limited, revealing a notable research gap. This highlights the importance of advancing further investigations to strengthen the understanding, design, and implementation of sustainable social security schemes for informal workers.

Overlay Visualization

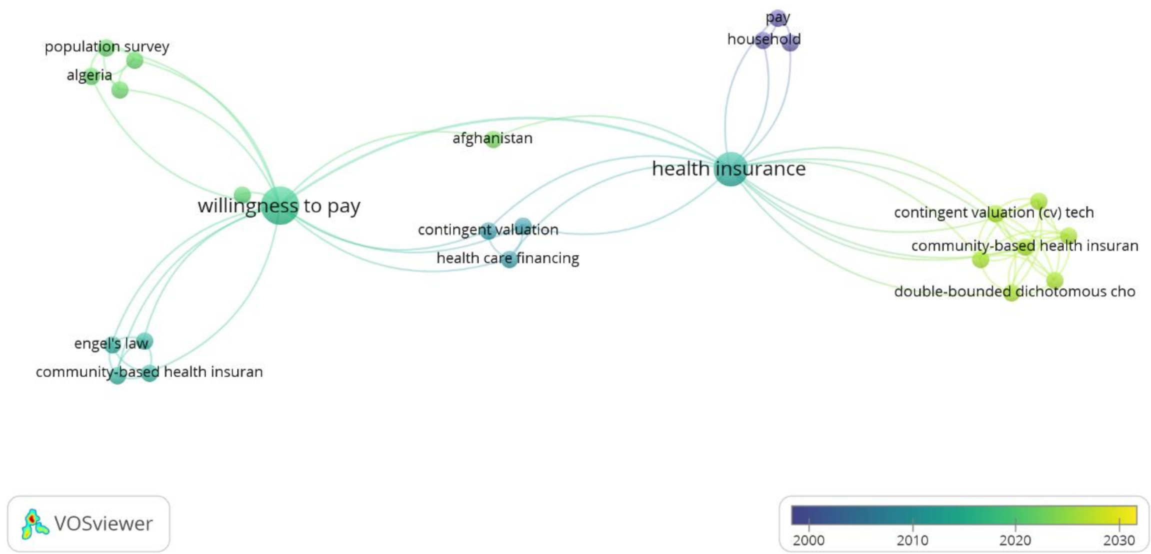

Figure 2. Overlay Visualization

The second visualization illustrates the temporal distribution of keywords by publication year. Blue represents earlier studies (2000s), while yellow indicates keywords that have emerged in more recent years (around 2020 onwards). Keywords such as community-based health insurance, double-bounded dichotomous choice, and contingent valuation (CV) techniques appear in yellow-green, suggesting that these themes have rapidly gained prominence in the last five years. This reflects a growing scholarly interest in innovative approaches, particularly the application of technology-driven valuation methods and the development of community-based insurance models that may offer relevant solutions for informal workers' social security schemes.

Conversely, keywords such as population survey, Algeria, and pay appear in bluish tones, indicating that earlier studies focused more on household survey data and conventional economic frameworks. This demonstrates a methodological transition over time, from traditional, country-specific survey approaches to more sophisticated, participatory, and technology-based designs for evaluating willingness and ability to pay.

Overall, the temporal mapping reveals a clear research shift: while earlier literature concentrated on measuring demand and affordability through conventional economic tools, more recent studies emphasize innovation, inclusivity, and methodological refinement. However, it also underscores the need to expand future research in this area to provide stronger evidence for policy design and implementation.

Density Visualization

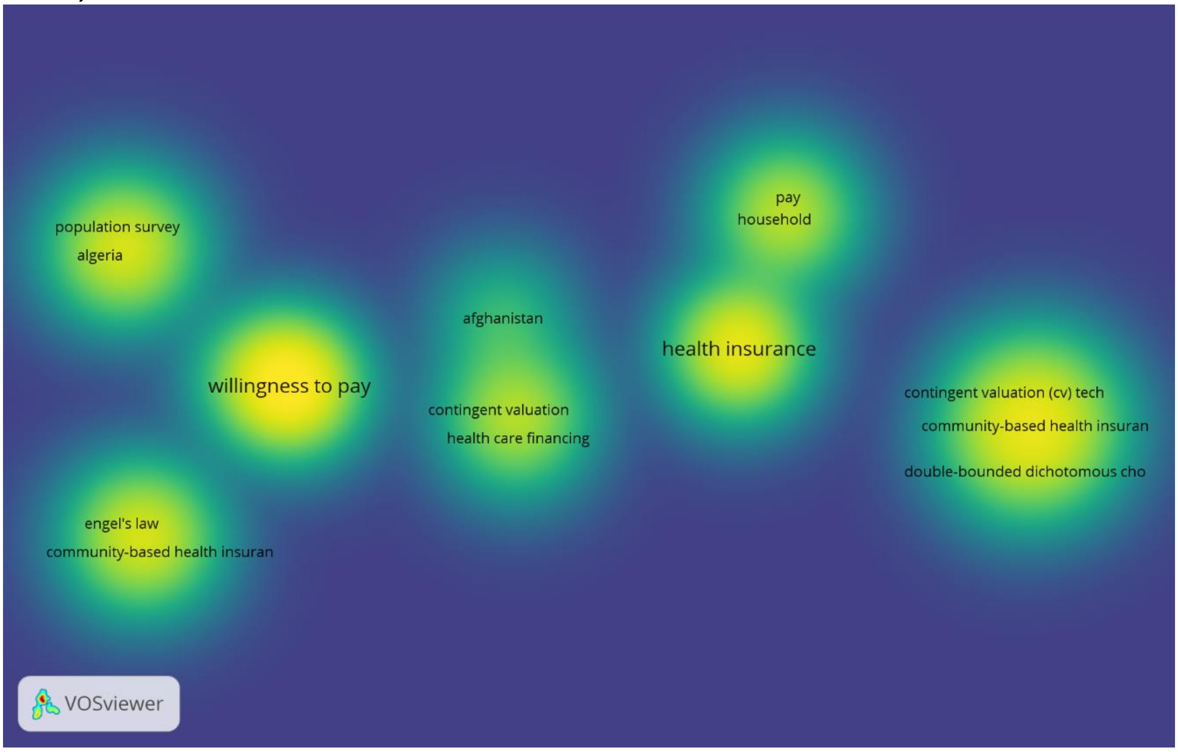

Figure 3. Density Visualization

The third visualization is a keyword density map, in which the terms willingness to pay and health insurance appear in bright yellow, reflecting their high frequency and central importance in the literature. Surrounding them are related keywords such as population survey, Afghanistan, community-based health insurance, and contingent valuation, indicating that the intellectual structure of this field is firmly rooted in discussions of demand-side willingness to pay and the design of health-related social protection. Other terms such as Engel's law, household, and pay reinforce the role of household economics and social justice dimensions in shaping the discourse.

This density map highlights several key insights. First, research methodologies have evolved: early studies relied on simple contingent valuation approaches at the household level, whereas more recent works have employed advanced methods such as double-bounded dichotomous choice, bootstrap estimation, and experimental techniques, which enhance validity and reduce bias in WTP estimates. Second, there is growing attention to community-based schemes and micro-contributions, often supported by digital technologies, to adapt social security designs for informal workers with irregular incomes. Third, geographical disparities remain evident: much of the literature focuses on Africa and Asia, whereas Latin America and the Middle East receive comparatively limited attention. Moreover, health insurance dominates the agenda, while other forms of social security—such as pensions or work accident protection—are rarely explored. Fourth, behavioral and institutional factors such as trust in managing agencies, access to information, and past experiences strongly influence willingness to participate. Finally, socioeconomic and educational variables show mixed effects, with income fluctuations representing the most consistent barrier for ability to pay, underscoring the need for adaptive and context-specific program design.

Taken together, this visualization confirms that willingness to pay and health insurance form the core of the academic discourse. Yet, it also reveals that research explicitly addressing health-related social security for informal workers remains relatively limited. This underscores the need to further expand research in this area to build a stronger evidence base for the design of inclusive and sustainable employment social security systems.

Hypothesis assessment in light of the map

Table 1. Hypothesis assessment

Hypothesis	Evidence	Verdict
H1: Information exposure and the intensity of socialization are positively associated with informal workers' willingness to pay for social security.	Cluster D links CV tech and CBHI nodes with recent 'outreach' keywords; empirical studies show > 2× higher uptake where targeted campaigns run.	Supported
H2: Income instability is negatively associated with the ability and willingness to pay for social security.	The nodes for Engel's law and community-based employment social security are in the same cluster, indicating that the share of food expenditure (a proxy for cash flow tightness) is routinely modeled as a negative predictor.	Supported
H3: Education level is not always directly proportional to WTP; its effect depends on perceived benefits and specific working conditions.	Mixed placement of population survey and household nodes across clusters suggests heterogeneity; some studies (e.g., Ethiopia, 2023) find inverse relationships.	Partially supported

Source: analysis of results

CONCLUSION

This bibliometric review presents a comprehensive overview of the development of literature on willingness and ability to pay for social security among informal workers from 2010 to 2025. The analysis indicates that this topic is receiving increasing scholarly attention, particularly in developing countries with high levels of labor informality. The dominance of keywords such as willingness to pay and employment social security indicates that research remains heavily focused on the financial dimension and access to health protection, with approaches that are now increasingly diverse and complex.

Visualizations from VOSviewer reveal a shift from conventional survey-based approaches to more participatory and technology-based program designs. In addition, strong links between the themes of education, information, and institutional trust emerge as important factors influencing informal workers' decisions to participate. These findings reinforce the need for policy interventions that are responsive to the characteristics of the informal sector, through flexible payment schemes, strengthened community-based socialization, and enhanced transparency and accountability of managing institutions.

In the future, studies on informal workers' social security should be expanded to dimensions beyond health, such as pensions and work injuries. Research should also explore longitudinal and experimental approaches to better understand the long-term impacts of various program designs. Thus, research findings can serve as a foundation for designing an inclusive, adaptive, and sustainable social security system that supports the universal social protection agenda.

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