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DETERMINANT OF HEALTH INSURANCE ENROLLMENT FOR THE INFORMAL SECTOR IN LOW AND MIDDLE-INCOME COUNTRIES: A SYSTEMATIC REVIEW

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Abstract: The health insurance schemes are implemented to achieve universal coverage through covering medical expenses that emerge due to an illness. This study was a systematic review to identify and analyze factors associated with health insurance enrollment for the informal sector that dominates the workforce in most developing countries. Six databases, namely: PubMed, Taylor and Francis online (Tandfonline), Science Direct, Scopus, Journal Storage (JSTOR) and Google Scholar were systematically traced in September-October 2020 to identify English-language research that analyzed the determinants of health insurance enrollment for the informal sector and published in the period 2010-2020. A total of 15 articles both quantitative and mix-methods analysis were included after final assessment. Most of the studies was conducted in Africa and Asia and only one article was conducted in Latin America. All studies demonstrated several factors associated to health insurance registration including sociodemographic characteristics, knowledge, chronic disease, information, and health service utilization, premium, subsidy, health status, trust, and capital, drug provision, perceived susceptibility, perceive seriousness, perceived benefit, family and social support. Findings from this systematic review can be encourage for policy-makers interested in expansion of health insurance membership for informal workers especially in developing countries.

Keywords: determinant, enrollment, health insurance, informal sector

Introduction

The country economic development is related to informal employment. Lower-income countries typically have higher levels of informal employment. Informal work consists of self-employed and paid work that is not normally recognized, regulated, or protected by law or regulation (Amin, 2002). Most of employed population in the world make their living in the informal economy. The informal sector may be defined as informal micro, small and medium enterprises with low wages and low productivity and serving a very local market (Rothenberg et al., 2016).

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As part of efforts to achieve universal health coverage (UHC), social protection such as health insurance has an advantage for informal sector workers that provides security against uncertain income and reduces vulnerabilities (Kidd & Damerau, 2016). The Universal Health Coverage (UHC) is important priority by Low and Middle-Income Countries (LMICs) for providing quality essential health services and reducing financial hardship. UHC is one target of the Sustainable Development Goals (SDGs) in 2030. One of the principal challenges to UHC in developing countries is a high proportion of workers in the informal sector that by the scheme they must voluntarily register in the National Health Insurance System (NHIS) as self-enrolled member (Dartanto et al., 2020).

Health insurance enrollment for informal sector community needs to be discussed because of the vulnerability of the informal sector community to the risk of health problems and income insecurity. This systematic review aims at identifying the influencing factors of social health insurance participation in the informal sector.

Materials and Methods

This present review demonstrates a detailed process and employs a search strategy by identifying, assessing, and synthesizing all relevant studies on health insurance enrollment for the informal sector. The review was carried out based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement (Moher et al., 2009). Research with a systematic review refers to the PRISMA statement which outlines a flow chart consisting of four main stages, namely: identification, screening, feasibility and determination of articles to be included for the study (Selcuk, 2019).

The first step is Identification, which begins with establishing PICOS (Population, Intervention, Comparative Intervention, Outcome and Studies). In accordance with the objectives of this study, it was determined that the population of this study was the informal sector community; the form of intervention in this research is social health insurance; comparisons will be made against other health insurance schemes (private and voluntary); the expected results are the determinants of participation; and the targeted literature is journal publication which is the result of original research. After establishing the study PICOS, the researcher determined the inclusion and exclusion criteria. This information is needed to limit and filter the available literature to suit the research objectives. We included all studies that reported related factors with health insurance enrollment for informal sector. For this study, health insurance was social health insurance, CBHI and NHI scheme were all considered as synonyms. Information contained in the inclusion criteria, including: selection of 6 online databases that match the chosen topic (PubMed, Taylor and Francis online (Tandfonline), Science Direct, Scopus, Journal Storage (JSTOR) and Google Scholar); articles published in the last 10 years (2010–2020); using all types of research except literature review/systematic review, in English; the informal sector community as a population; the type of publication is limited to unpaid literature in the scope of public health; and keywords in the form of determinant, enrollment, health insurance, informal sector. Then the query used to search the literature was “determinant OR “factors affecting” OR “affecting factors” AND “national health insurance” OR “mandatory health insurance” OR “social health insurance” AND enrollment OR membership AND “informal sector”. From this step, 411 literatures were filtered.

The second step is screening. In this step, all retrieved references that have been obtained will be checked for duplication by entering and grouping the articles into the reference manager (in this study, Mendeley was used) so that 23 duplicate articles were found.

The third stage in this research is the Eligibility Check. At this stage, articles that pass the duplication stage will be refiltered manually whether the title and abstract of the article are in accordance with PICOS and whether the article can be accessed in full text without paying. Furthermore, full text articles that are suitable for PICOS are critically examined to assess their feasibility based on 11 questions of JBI Critical Appraisal Checklist for Systematic Reviews and Research Syntheses.

The final step is to decide which articles will be included in the qualitative synthesis. There were 15 articles that were deemed suitable for qualitative synthesis which were sourced from the PubMed, Taylor and Francis online (Tandfonline), Scopus, Journal Storage (JSTOR), Google Scholar and no articles from the Science Direct database were included in this qualitative study. Extraction and synthesis of important information is arranged in a table to compare the characteristics of the literature and the findings of each article. Information that will be displayed includes the author, year of publication, time of research data collection, country, research method/design, sampling technique, number of samples, types of data collected, and variables that correlate with health insurance admission in the informal sector community. The comparative data will be analyzed further to obtain information about research gaps and research updates.

Results and Discussion

Study Selection

Four phases of this review are indicated in a flow diagram (Figure 1). A total of 411 studies were acquired through a comprehensive search of the electronic databases. The remaining 388 studies' (after removing the duplicates) titles and abstract were filtered; we rejected 368 clearly irrelevant publications. The remaining 20 full texts were assessed for eligibility. Among the potentially eligible studies, five were removed because the papers were systematic review. Thus, 15 publications were included for this review as illustrated in Figure 1.

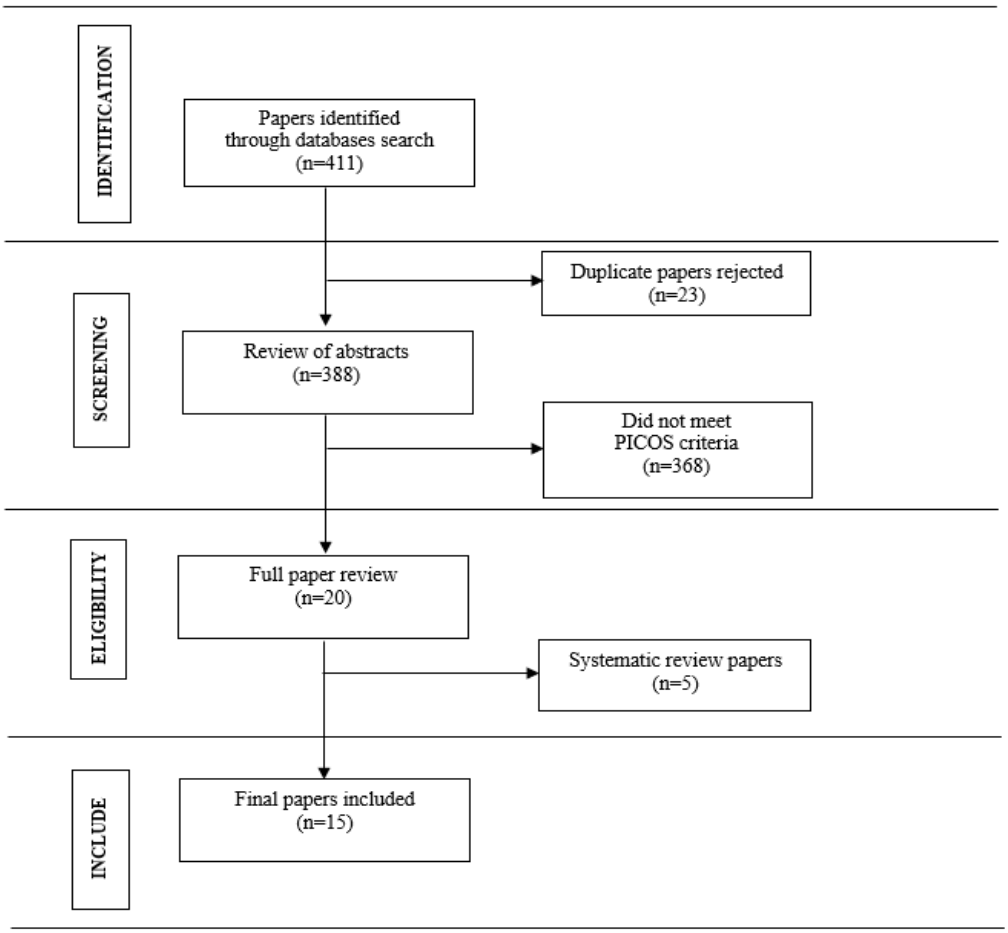

Figure 1: PRISMA flow diagram for eligible study

Overview of Included Articles

A total of 15 papers were reviewed, 13 studies used quantitative approach and two mixed methods. Table 1. described a detailed summary of included studies characteristics. All studies conducted in a single country studies covered Asia including Vietnam, Bangladesh and Indonesia as well as on the African continent, namely Kenya, Tanzania, Ghana, Cameroon, Nigeria and Ethiopia and one study was conducted in the Latin America is the country of Nicaragua. There were four studies conducted in Indonesia. The informal sector respondents in current review were informal sector workers, entrepreneurs, traders, farmers, and those who do not work. In general, majority of the included studies on health insurance participation in the informal sector used cross-sectional research designs (Azuogu et al., 2016; Boateng et al., 2017; Dartanto et al., 2016; Greef et al., 2016; Masanyiwa et al., 2020; Nga et al., 2020; Noubiap et al., 2013; Sari & Idris, 2019; Sarker et al., 2017). There were three studies used a case-control design (Nugraha et al., 2019; Prakoso et al., 2020; Taddesse et al., 2020), two studies used a mix-methods approach (Macha et al., 2014; Thornton et al., 2010) and only one experimental design article (Wagstaff et al., 2016). Non-probability sampling technique were applied in seven articles (Boateng et al., 2017; Greef et al., 2016; Masanyiwa et al., 2020; Noubiap et al., 2013; Nugraha et al., 2019; Prakoso et al., 2020; Sarker et al., 2017) and there were eight studies adopted probability sampling (Azuogu et al., 2016; Dartanto et al., 2016; Macha et al., 2014; Nga et

al., 2020; Sari & Idris, 2019; Taddesse et al., 2020; Thornton et al., 2010; Wagstaff et al., 2016). The included papers characteristics in this systematic review are reported in Table 1 below.

Table 1: Summary of eligible articles

No.	Author ID/ Year of publication	Time of research	Country	Study design	Sampling technique	Sample size	Dataset	Type of informal sector
1	Taddesse (2020)	2016	Ethiopia	Unmatched case-control design	Stratified random sampling	296 households	Primary data	Informal sector workers
2	Noubiap (2013)	2010	Cameroon	Cross-sectional design	Convenient and consecutive sampling	160 individuals	Primary data	Informal sector workers
3	Thornton (2010)	2007-2008	Nicaragua	Mix method	Random sampling	2.608 individuals	Primary data	Market workers
4	Azuogu (2016)	2015	Nigeria	Cross-sectional design	Three-stage sampling	419 individuals	Primary data	Traders
5	Masanyiwa (2020)	2018	Tanzania	Cross-sectional design	Purposive sampling	184 individuals	Primary data	Traders
6	Nugraha (2019)	-	Indonesia	Case control design	Purposive sampling	260 individuals	Primary data	Informal sector workers
7	Boateng (2017)	-	Ghana	Cross-sectional design	Purposive sampling	392 individuals	Primary data	Migrant female head porters
8	Prakoso (2020)	2019	Indonesia	Case control design	Purposive sampling	200 individuals	Primary data	Informal sector workers
9	Nga (2020)	2016	Vietnam	Cross-sectional design	Stratified and cluster sampling	469 households	Primary data	Informal sector workers
10	Sarker (2017)	2014	Bangladesh	Cross-sectional design	Purposive sampling	784 households	Primary data	Informal sector workers
11	De Groot-de Greef (2016)	2012	Kenya	Cross-sectional design	Quota and convenience sampling	135 individuals	Primary data	Dairy farmers
12	Sari (2019)	2014	Indonesia	Cross-sectional design	Multistage sampling	6.888 households	Secondary data	Individuals aged ≥40 years who enrolled NHI independently
13	Dartanto (2016)	-	Indonesia	Cross-sectional design	Multistage sampling	400 households	Primary data	Informal sector workers
14	Wagstaff (2016)	2012-2013	Vietnam	Cluster randomized experiment	Stratified random sampling	3.000 households	Primary data	Informal sector workers
15	Macha (2014)	2008	Tanzania	Mix method	Stratified random sampling	1.225 households and 7.959 individual	Primary data	Informal sector workers

Judging from the type of data used, most studies use primary data collected through surveys using questionnaires or interviews with interview guidelines; while secondary data in the form of reports of previous survey results are also used (Sari & Idris, 2019); Furthermore, when examined from the number of samples required, research that uses primary data has a tendency to take samples of less

than 1,000 respondents and only three studies used samples of more than 1,000 respondents (Macha et al., 2014; Thornton et al., 2010; Wagstaff et al., 2016) but less than 5,000 respondents. Meanwhile, research that used secondary data conducted with sample almost 7.000 individuals (Sari & Idris, 2019). Meanwhile, according to the study period, previous research on this topic used data taken from 2007 to 2019. From several existing studies, two of them used data before 2010 even though the study was published in the 2010-2020 period (Macha et al., 2014; Thornton et al., 2010).

Determinants of Social Health Insurance Enrollment for the Informal Sector

The studies included in this study use quantitative analysis and mix-methods that measure the determinants of health insurance participation for informal sectors carried out in ten countries and with study locations in certain cities or districts. This leads to contextual differences in the results interpretation. The included articles have variations in regional context, design of study, and outcome variables; therefore, authors do not combine all the study results using the meta-analysis. The authors use narrative synthesis to write this review in detail.

Information concerning purchasing power parity (PPP)-based GDP data can be useful for comparing general differences in living standards between countries because PPPs consider the relative cost of living and countries inflation rates rather than just using exchange rates, which can distort real income differences. Therefore, income per capita based on PPP is often used as an indicator of a country's standard of living. From the official website of the World bank, PPP-based per capita income data was obtained for all articles included in this systematic review. It can be illustrated that Indonesia has a per capita income (PPP) above 10,000 USD since 2014, followed by Vietnam which reached 6,573 USD in 2016. While other countries such as countries in Africa, namely Ethiopia, Cameroon, Tanzania, Ghana, Nigeria, Kenya, are close to 2,000 USD to 5,500 USD. For the country of Nicaragua in 2008 data obtained close to 4,000 USD. And the country of Bangladesh in 2014 per capita income (PPP) was only 3,368 USD.

Tables 2 and 3 below describe the determinants of health insurance participation in the informal sector based on studies from previous studies that have passed through the systematic review stages. There are 11 sociodemographic variables obtained from included studies in this systematic review. namely: age, sex, religion, education, occupation, marital status, residency, region, family size, number of children, and income. Thus, sociodemographic factors are important to study to increase social insurance participation. Not all sociodemographic variables were analyzed its correlation with health insurance enrollment by every researcher whose research articles were included in this systematic review. Sex and income were sociodemographic factors that show the most association with health insurance participation. Results for 11 sociodemographic factors analyzed in the included studies are illustrated in Table 2.

Table 2: Summary of sociodemographic factors for systematic review

No.	Author ID/ Year of publication	Age	Sex	Religion	Education Level	Occupation	Marital Status	Residency	Region	Family Size	Number of Children	Income
1	Taddesse (2020)	○	○	-	○	◉	◉	-	-	◉	-	◉
2	Noubiap (2013)	○	○	○	◉	-	○	-	-	-	-	○
3	Thornton (2010)	○	◉	-	○	-	○	-	-	-	◉	◉
4	Azuogu (2016)	○	○	-	○	-	○	-	-	-	-	-
5	Masanyiwa (2020)	○	◉	-	○	◉	-	-	-	-	-	◉
6	Nugraha (2019)	◉	-	-	◉	-	-	-	-	-	-	○
7	Boateng (2017)	◉	-	○	○	-	○	-	-	○	-	◉
8	Prakoso (2020)	○	-	-	◉	-	-	-	-	-	-	○
9	Nga (2020)	○	○	-	○	○	○	◉	-	-	-	○
10	Sarker (2017)	○	◉	-	○	◉	○	○	-	◉	-	○
11	De Groot-de Greef (2016)	○	○	-	○	-	○	-	-	-	○	-
12	Sari (2019)	◉	○	-	◉	◉	-	◉	◉	-	-	-
13	Dartanto (2016)	○	◉	-	○	-	-	-	-	◉	-	◉
14	Wagstaff (2016)	○	○	-	○	-	○	-	-	○	-	-
15	Macha (2014)	-	◉	◉	○	○	○	○	-	◉	-	-

-: not include in the study; O: not statistically significant; ◉: statistically significant (p-value<0.05)

A variable that has a significantly associated with health insurance participation in this review was age of the respondents. This review indicated that young people are more likely to register in the scheme. These findings are supported by other studies in Senegal and Mali explained young individuals were more willing to pay health insurance (Chankova et al., 2008) as compared to the older persons, but contradict a study carried out in Ghana which assessed that persons aged 70 years or older are more likely to retain their insurance membership (Nsiah-Boateng et al., 2019). The important reason is that this community has more healthcare needs therefore, would register health insurance to reduce healthcare cost due to catastrophic diseases.

In terms of sex, there was statistically significant correlation between sex and health insurance enrollment. In these included studies, being a male was significantly correlated with enrollment in the insurance scheme. Similar trends were also observed in studies carried out in India and Burkina Faso that reported male headed households were to be more likely to enroll as compared to female headed households (Dong et al., 2003; Mathiyazhagan, 1998).

From three included studies, a study in Tanzania showed that religion has statistically significant correlation with health insurance registration. This result similar with a study conducted in Ethiopia which revealed that Christians are more likely to renew their insurance compared to Muslims and other religions (Badu et al., 2018). This was inconsistent from a related study that religion factor did not have an association with the health insurance memberships (Aku et al., 2021).

According to the current study findings, educational level of participants was a statistically significant factors correlated with the enrollment in social health insurance. Only four studies mentioned that education level had statistically significant association with health insurance uptake. This is in line with a previous study (Alkenbrack et al., 2013). The reasonable explanation is education affects people's thinking processes for certain health programs like that of being health insurance membership. Higher education will raise awareness of their health status and it will expand health insurance coverage.

Association between occupation variable and health insurance enrollment was confirm for this review. From six studies, only four studies showed statistically significant result between occupation and health insurance uptake. Being a merchant had statistically significant correlation with uptake of health insurance.

Regarding marital status aspect, ten included studies assessed its correlation with health insurance uptake. There was only one study evaluated that marital status as a predictor for uptake of health insurance. This result was in accordance with research carried out in Ghana that married persons are more willing to register health insurance than not married (Salari et al., 2019). However, a research conducted in different district in Ghana illustrated that marital status and health insurance status had not any statistically significant association (Aku et al., 2021).

Place of residence (rural or urban) also influenced health insurance enrollment. Four included studies analyzed association between residency and health insurance uptake, but only two studies showed its significant association. That evidence was supported by a previous study which indicated that residency was stated to have significant association with enrollment in community-based health

insurance (Fadlallah et al., 2018). However, in another study conducted in Ethiopia stated that residency was not significantly correlated with registration in health insurance (Nageso et al., 2020). This could be due to the different study settings.

Another key factor that affected health insurance scheme enrollment among informal sectors was the family size. This study reviewed that from six included studies, significant association between family size and health insurance enrollment was explained in four studies. Households with larger family sizes were more likely to be enrolled in health insurance than households with smaller family size. This result is similar with the study conducted in Ethiopia (Kebede, 2014; Pythagore H, Donfouet P, Mahieu EMP, 2015). This might be due to the fact that, as the family size increases, the frequency of family members getting sick might also increase, and out-of-pocket payment for seeking health service may raise. This was related with the huge financial burden that large households faced at times of risk (Mirach et al., 2019).

The included study conducted in Nicaragua informed correlation between number of children with health insurance uptake. The reasonable explanation is that children are at high risk of developing preventable conditions if they do not obtain appropriate care when they are getting ill or injured. Thus, health insurance will help households that having many children to prevent financial burden of health service cost.

In addition, in term of sociodemographic factors, this review indicated that the income of households and individuals was associated with the uptake of health insurance. Income had statistically significant correlation with health insurance enrollment as showed by five included studies that were conducted in. This could be explained that those who have low income spend their money on other things which they believe to be more necessary than participate to health insurance.

According to study results, 17 other related factors are assessed its correlation with the uptake of social health insurance among informal sectors as presented in Table 3. These factors were: chronic diseases, health status, trust, motivation, subsidy, premium, capital, knowledge, information, drug provision, perception on health insurance, perceived susceptibility, perceived seriousness, perceived benefit, family support, social support, and health service utilization.

Table 3: Summary of results concerning determinant of health insurance enrollment

No	Author ID/ Year of publication	Chronic diseases	Health status	Trust	Motivation	Subsidy	Premium	Capital	Knowledge	Information	Drug provision	Perception on health insurance	Perceived susceptibility	Perceived seriousness	Perceived benefit	Family support	Social support	Health service utilization
1	Taddesse (2020)	◉	-	◉	-	-	◉	-	-	-	-	-	-	-	-	-	-	-
2	Noubiap (2013)	-	-	-	-	-	-	-	O	-	-	-	-	-	-	-	-	-
3	Thornton (2010)	◉	-	-	-	◉	-	-	-	◉	-	-	-	-	-	-	-	O
4	Azuogu (2016)	-	-	-	-	-	-	-	O	-	-	-	-	-	-	-	-	O
5	Masanyiwa (2020)	-	-	-	-	-	◉	◉	-	-	-	-	-	-	-	-	-	-
6	Nugraha (2019	-	-	-	O	-	-	-	◉	-	-	O	-	-	-	-	-	-
7	Boateng (2017)	-	O	-	-	-	-	-	-	-	◉	-	-	-	-	-	-	-
8	Prakoso (2020)	-	-	-	-	-	-	-	◉	-	-	-	◉	◉	◉	◉	◉	-
9	Nga (2020)	O	-	-	-	-	-	-	◉	-	-	-	-	-	-	-	-	◉
10	Sarker (2017)	-	O	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	De Groot-de Greef (2016)	-	-	-	-	-	-	-	-	◉	-	-	-	-	-	-	-	-
12	Sari (2019)	◉	◉	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	Dartanto (2016)	-	-	-	-	-	O	-	◉	-	-	-	-	-	-	-	-	◉
14	Wagstaff (2016)	O	-	-	-	◉	-	-	-	◉	-	-	-	-	-	-	-	-
15	Macha (2014)	-	O	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

-: not include in the study; O: not statistically significant; ◉: statistically significant (p-value<0.05)

Several other related factors were associated with enrollment in the social health insurance among informal sector workers. Results of this review clarified that 15 factors had correlation with health insurance uptake. Knowledge, chronic diseases and provided information about health insurance were found most statistically significant correlation with health insurance in included studies.

The knowledge is an important factor that was found to affect the scheme enrollment. Knowledge was stressed in included studies conducted in Indonesia and Vietnam. Participants who have low knowledge of health insurance are more likely to stop participating insurance scheme than participants who have good understand about health insurance. A possible reason may be a lack of health insurance, which may raise the dropout ratio. In other words, having a good knowledge of health insurance will increase enrollment.

It is important to note that family with high illness rates has a higher tendency to be member of the health insurance scheme. Individuals who had not chronic diseases were less likely to be registered in health insurance than individuals whose family members experienced chronic diseases. This reasonable explanation was high-risk persons usually prefer to be insured than the healthy people to reduce financial burden of out-of-pocket payment for health services (Nageso et al., 2020).

This current study indicated that provided information about health insurance is statistically significant correlated with health insurance membership. This is in support of a research conducted in Abuja, Nigeria (Ogben & Ilesanmi, 2018). People who obtain good health insurance information may search details information of the program and receive more understandings of its advantages that encourages them to be enrolled in the program.

Regarding correlation between health service utilization and health insurance membership, this study analyzed that there were association between the two variables as seen in studies conducted in Vietnam and Indonesia. A study conducted in Nepal reported that, people's unwillingness to enroll of health insurance because of dissatisfaction of health service delivery such as lack of drugs, long service waiting time, inadequate infrastructure, unfriendly behavior of health workers (Ranabhat et al., 2020). Similarly with study conducted in Karnataka, India mentioned that decision to renew registration of health insurance depended on the experience of individuals satisfaction level with the services provided (Savitha, 2017).

The premium cost had correlation with health insurance enrollment as indicated in two included studies in Ethiopia and Tanzania. Affordable premium may raise insurance enrollment. Informal sectors workers are unlikely to insure as they were financially incapable because of any decrease in income (Wagstaff, 2000).

Subsidy for the informal sector workers were also claimed as a variable associated with an increase in enrollment of health insurance in the two studies. Obtaining subsidies motivate participants because it reduces the price of insurance. Similarly with a study from Vietnam (Hendryx et al., 2012),

financially ineligible factor was a primary cause for disenrollment, therefore increased cost sharing is needed.

Furthermore, health status was also evaluated to be a predictor of health insurance participation. Finding from a study in Ghana, showed that health status had correlation with with the probability of being registered in health insurance. The health status variable for that study originated from two proxies, namely a morbidity event in the last 2 weeks and disability (Salari et al., 2019).

In addition, trust, capital, drug provision, perceived susceptibility, perceived seriousness, perceived benefit, family support, social support had predictive power in determining health insurance enrollment. These findings were in line with study in Ethiopia, which measured that a trust in health insurance scheme had a strong association with enrollment (Eseta et al., 2020). These could be further explained by unresponsiveness to consumer's expectation might encourage a lack of trust in the scheme. Family and social support from the surrounding environment were also factors that are significantly related to the decision to become a health insurance member. These describe the role of family and social solidarity in joining for the scheme. Thus, increasing social support in designing social health insurance schemes will increase acceptability and participation.

Perception on health insurance benefit and motivation had not statistically significant association with health insurance uptake as found in included study in Indonesia. On the contrary, studies carried out in Ghana observed that perceived health insurance beneficial as good are more likely to uptake than those who do not think as such (Jehu-Appiah et al., 2012).

The publications included in this review derive from different disciplines including public health and economics. Although there are several variations in the methodology of each discipline implements, the included studies applied either a quantitative approach or a mixed-method approach. The qualitative and quantitative analyses in mix-method approach measured different factors and were undertaken in different countries. This causes contextual differences in the results interpretation.

The use of a mixed-method approach provides complementary reply to the research questions that could not be comprehensive answered by only quantitative or qualitative methods. This also yielded more relevant evidence to inform policy and practice. The different type of studies included in this systematic review allows a rich set of evidence that needs to be further discussed in the context of UHC achievement.

Conclusion

In general, the type of health insurance studied include social health insurance with mandatory and voluntary of participation. The review revealed some important factors influencing participation in social health insurance among informal sectors. In summary, the main variables observed in included studies as influencing enrollment were sociodemographic factors (sex, income, age, education level, occupation, family size, residency, marital status, religion, number of children and region), knowledge, chronic disease, information, health service utilization, premium, subsidy, health status, trust, capital, drugs provision, perceived susceptibility, perceive seriousness, perceived benefit, family and social support.

This review is only limited to search results for publications from five online databases namely PubMed, Taylor and Francis online (Tandfonline), Science Direct, Scopus, Journal Storage (JSTOR) and Google Scholar. This study does not access other relevant databases or grayscale articles such as scientific conference proceedings, unpublished research articles such as study reports, theses or dissertations, which may address the review topic. Most of the quantitative studies included in this systematic review used cross-sectional designs with primary and/or secondary datasets which have basic limitations in determining causal direction between predictors and outcomes. Only associations can be assessed. Another limitation of this review is that it only searches English-language articles. Several other studies that may have met the inclusion criteria but were presented in another language were not included.

For some characteristics, variations identified in the different countries. Some variables have statistically significant while others have not statistically significant. However, this could be related to contextual differences. Thus, it is difficult to reach a conclusion concerning the impact of each variable on health insurance membership.

The research findings can be used as a reference for obtaining effective interventions in increasing health insurance participation in the informal sector in low-middle income countries (LMICs) related to UHC pursuing. For future research, it would be interesting to systematically review the determinants of health insurance participation among informal sector such as in Latin American countries since most of these countries present a high population percentage in the informal sector.

Declaration of Interest Statement

The authors declare that they have no conflict of interests.

References

Aku, K. M., Mensah, K. A., Twum, P., Agyei-Baffour, P., Opoku, D., & Brenyah, J. K. (2021). Factors influencing nonrenewal of health insurance membership in Ejisu-Juaben Municipality of Ashanti Region, Ghana. *Advances in Public Health*, 2021(2010). https://doi.org/10.1155/2021/5575822

Amin, A. T. M., & Singh, A., & Amin, A. T. M. N. (2002). The informal sector in Asia from the decent work perspective. International Labour Organization., 121. www.ilo.org/publns

Azuogu, B., Madubueze, U., Alo, C., Ogbonnaya, L., & Ajayi, N. (2016). Level of awareness, and factors associated with willingness to participate in the national health insurance scheme among traders in Abakaliki main market, Ebonyi State, Nigeria. *African Journal of Medical and Health Sciences*, 15(1), 18. https://doi.org/10.4103/2384-5589.183887

Badu, E., Agyei-Baffour, P., Ofori Acheampong, I., Preprah Opoku, M., & Addai-Donkor, K. (2018). Households sociodemographic profile as predictors of health insurance uptake and service utilization: A cross-sectional study in a Municipality of Ghana. *Advances in Public Health,* 2018, 1–13. https://doi.org/10.1155/2018/7814206

Boateng, S., Amoako, P., Poku, A. A., Baabereyir, A., & Gyasi, R. M. (2017). Migrant female head porters' enrolment in and utilisation and renewal of the national health insurance scheme in Kumasi, Ghana. *Journal of Public Health,* 25(6), 625–634.

Chankova, S., Sulzbach, S., & Diop, F. (2008). Impact of mutual health organizations: Evidence from West Africa. *Health Policy and Planning*, 23(4), 264–276. https://doi.org/10.1093/heapol/czn011

Dartanto, T., Halimatussadiah, A., Rezki, J. F., Nurhasana, R., Siregar, C. H., Bintara, H., Usman, Pramono, W., Sholihah, N. K., Yuan, E. Z. W., & Soeharno, R. (2020). Why do informal sector workers not pay the premium regularly? Evidence from the national health insurance system in Indonesia. *Applied Health Economics and Health Policy*, 18(1), 81–96. https://doi.org/10.1007/s40258-019-00518-y

Dartanto, T., Rezki, J. F., Pramono, W., Siregar, C. H., Bintara, U., & Bintara, H. (2016). Participation of informal sector workers in Indonesia's national health insurance system. *Journal of Southeast Asian Economies*, 317–342.

Dong, H., Kouyate, B., Snow, R., Mugisha, F., & Sauerborn, R. (2003). Gender's effect on willingness-to-pay for community-based insurance in Burkina Faso. *Health Policy*, 64(2), 153–162. https://doi.org/10.1016/S0168-8510(02)00144-6

Eseta, W. A., Lemma, T. D., & Geta, E. T. (2020). Magnitude and determinants of dropout from community-based health insurance among households in Manna District, Jimma Zone, Southwest Ethiopia. *ClinicoEconomics and Outcomes Research*, 12, 747–760. https://doi.org/10.2147/CEOR.S284702

Fadlallah, R., El-Jardali, F., Hemadi, N., Morsi, R. Z., Abou Samra, C. A., Ahmad, A., Arif, K., Hishi, L., Honein-Abouhaidar, G., & Akl, E. A. (2018). Barriers and facilitators to implementation, uptake and sustainability of community-based health insurance schemes in low- and middle-income countries: A systematic review. *International Journal for Equity in Health*, 17(1), 1–18. https://doi.org/10.1186/s12939-018-0721-4

Greef, T. D. G. De, Monareng, L. V., & Roos, J. H. (2016). A quantitative study on factors influencing enrolment of dairy farmers in a community health insurance scheme. *BMC Health Services Research*, 16(1), 1–10. https://doi.org/10.1186/s12913-016-1925-1

Hendryx, M., Onizuka, R., Wilson, V., & Ahern, M. (2012). Effects of a cost-sharing policy on disenrollment from a state health insurance program. *Social Work in Public Health*, 27(7), 671–686. https://doi.org/10.1080/19371910903269653

Jehu-Appiah, C., Aryeetey, G., Agyepong, I., Spaan, E., & Baltussen, R. (2012). Household perceptions and their implications for enrolment in the national health insurance scheme in Ghana. *Health Policy and Planning*, 27(3), 222–233. https://doi.org/10.1093/heapol/czr032

Kebede, A. (2014). Willingness to pay for community based healthiInsurance among households in the rural community of Fogera District, North West Ethiopia. *International Journal of Economics, Finance and Management Sciences*, 2(4), 263. https://doi.org/10.11648/j.ijefm.20140204.15

Kidd, S., & Damerau, V. (2016). The political economy of social protection for informal economy workers in Asia. In social protection for informal workers in Asia. www.adb.org

Macha, J., Kuwawenaruwa, A., Makawia, S., Mtei, G., & Borghi, J. (2014). Determinants of community health fund membership in Tanzania: a mixed methods analysis. *BMC Health Services Research*, 14, 538. https://doi.org/10.1186/s12913-014-0538-9

Masanyiwa, Z. S., Mosha, E. S., & Mamboya, S. F. (2020). Factors influencing participation of informal sector workers in formal social security schemes in Dodoma City, Tanzania. *Open Journal of Social Sciences*, 8(06), 229.

Mathiyazhagan, K. (1998). Willingness to pay for rural health insurance through community participation in India. *International Journal of Health Planning and Management,* 13(1), 47–67. https://doi.org/10.1002/(SICI)1099-1751(199801/03)13:1<47::AID-HPM495>3.0.CO;2-I

Mirach, T. H., Demissie, G. D., & Biks, G. A. (2019). Determinants of community-based health insurance implementation in west Gojjam zone, Northwest Ethiopia: A community based cross sectional study design. *BMC Health Services Research*, 19(1), 1–8. https://doi.org/10.1186/s12913-019-4363-z

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., Altman, D., Antes, G., Atkins, D., Barbour, V., Barrowman, N., Berlin, J. A., Clark, J., Clarke, M., Cook, D., D'Amico, R., Deeks, J. J., Devereaux, P. J., Dickersin, K., Egger, M., Ernst, E., … Tugwell, P. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLoS Medicine,* 6(7). https://doi.org/10.1371/journal.pmed.1000097

Nageso, D., Tefera, K., & Gutema, K. (2020). Enrollment in community based health insurance program and the associated factors among households in Boricha district, Sidama Zone, Southern Ethiopia; a cross-sectional study. *PLoS ONE*, 15(6), 1–14. https://doi.org/10.1371/journal.pone.0234028

Nga, N. T. T., Xiem, C. H., & Anh, B. T. M. (2020). Universal coverage challenges: Determinants of enrolment in family-based social health insurance. *International Journal of Healthcare Management,* 1–7.

Noubiap, J. J. N., Joko, W. Y. A., Obama, J. M. N., & Bigna, J. J. R. (2013). Community-based health insurance knowledge, concern, preferences, and financial planning for health care among informal sector workers in a health district of Douala, Cameroon. *Pan African Medical Journal,* 16, 1–9. https://doi.org/10.11604/pamj.2013.16.17.2279

Nsiah-Boateng, E., Nonvignon, J., Aryeetey, G. C., Salari, P., Tediosi, F., Akweongo, P., & Aikins, M. (2019). Sociodemographic determinants of health insurance enrolment and dropout in urban district of Ghana: A cross-sectional study. *Health Economics Review*, 9(1). https://doi.org/10.1186/s13561-019-0241-y

Nugraha, A., Ulfah, N., Isa, M., & Ilmi, B. (2019). Factors influencing the participation of national health insurance independently. *Indian Journal of Public Health Research & Development,* 10(4), 561–566.

Ogben, C., & Ilesanmi, O. S. (2018). Community based health insurance scheme: Preferences of rural dwellers of the federal capital territory Abuja, Nigeria. *Journal of Public Health in Africa*, 9(1), 54–59. https://doi.org/10.4081/jphia.2018.540

Prakoso, A. D., Sulaeman, E. S., & Suryono, A. (2020). Application of health belief model on factors affecting participation in the national health insurance scheme among informal sector workers in Kudus, Central Java. *Journal of Health Policy and Management*, 5(1), 61–73.

Pythagore H, Donfouet P, Mahieu EMP, M. E. (2015). Fdre- Evaluation of community-based health insurance pilot schemes in Ethiopia: Final Report. May, 21.

Ranabhat, C. L., Subedi, R., & Karn, S. (2020). Status and determinants of enrollment and dropout of health insurance in Nepal: An explorative study. *Cost Effectiveness and Resource Allocation*, 18(1), 1–13. https://doi.org/10.1186/s12962-020-00227-7

Rothenberg, A. D., Gaduh, A., Burger, N. E., Chazali, C., Tjandraningsih, I., Radikun, R., Sutera, C., & Weilant, S. (2016). Rethinking Indonesia's informal sector. *World Development*, 80, 96–113. https://doi.org/10.1016/j.worlddev.2015.11.005

Salari, P., Akweongo, P., Aikins, M., & Tediosi, F. (2019). Determinants of health insurance enrolment in Ghana: Evidence from three national household surveys. *Health Policy and Planning,* 34(8), 582–594. https://doi.org/10.1093/heapol/czz079

Sari, B., & Idris, H. (2019). Determinant of independent national health insurance ownership in Indonesia. *Malaysian Journal of Public Health Medicine,* 19(2), 109–115.

Sarker, A. R., Sultana, M., Mahumud, R. A., Ahmed, S., Islam, Z., Morton, A., & Khan, J. A. M. (2017). Determinants of enrollment of informal sector workers in cooperative based health scheme in Bangladesh. *PloS One,* 12(7), e0181706. https://doi.org/10.1371/journal.pone.0181706

Savitha, B. (2017). Why members Dropout? An evaluation of factors rffecting Renewal in micro health insurance. *Journal of Health Management,* 19(2), 292–303. https://doi.org/10.1177/0972063417699691

Selcuk, A. A. (2019). A guide for systematic reviews: PRISMA. *Turkish Archives of Otorhinolaryngology,* 57(1), 57–58. https://doi.org/10.5152/tao.2019.4058

Taddesse, G., Atnafu, D. D., Ketemaw, A., & Alemu, Y. (2020). Determinants of enrollment decision in the community-based health insurance, North West Ethiopia: A case-control study. *Globalization and Health,* 16(1), 4. https://doi.org/10.1186/s12992-019-0535-1

Thornton, R. L., Hatt, L. E., Field, E. M., Islam, M., Solís Diaz, F., & González, M. A. (2010). Social security health insurance for the informal sector in Nicaragua: A randomized evaluation. *Health Economics,* 19(S1), 181–206.

Wagstaff, A. (2000). Research on equity, poverty and health outcomes. In October (Issue October).

Wagstaff, A., Nguyen, H. T. H., Dao, H., & Bales, S. (2016). Encouraging health insurance for the informal sector: A cluster randomized experiment in Vietnam. *Health Economics*, 25(6), 663–674. https://doi.org/10.1002/hec.3293