Search

Explore journals   Get published   About BMC   Login

Menu

BMC Public Health

Home   About   Articles   Submission Guidelines   Collections

Search articles within this journal

Submit manuscript

Latest collections open to submissions

NEW: Transportation as a social determinant of health

Guest Edited by David Ederer, Ipek N. Sener and Owen Waygood

NEW: Migration and health

Guest Edited by Florian Fischer, Shira Goldenberg and Chengchao Zhou

NEW: Parenting role in childhood obesity

Guest Edited by Mekdes Gebremariam and Jiying Ling

Epidemiology of viral hepatitis

Guest Edited by Mawuena Binka, Antony P. Black, Zahid Ahmad Butt and Jack Wallace

Click here for all journal collections

Editors' picks

Editors' picks

School-based interventions can reduce and prevent psychotic experiences in adolescence.

Energy drink consumption is associated with several negative health indicators in adolescents.

The experiences following Hurricane Maria in Puerto Rico offer important lessons regarding the potential impacts of catastrophic disasters on NCD treatment and management, and are useful for improving community and health system resilience and preparedness for future disasters.

Articles

Recent	Most accessed

An overview of cervical cancer epidemiology and prevention in the Baltic States

Una Kojalo, Anna Tisler, Kersti Parna, Anda Kivite-Urtane, Jana Zodzika, Mindaugas Stankunas, Nicholas Baltzer, Mari Nygard and Anneli Uuskula

Research | 7 April 2023

Lessons learned to improve COVID-19 response in communities with greatest socio-economic vulnerabilities

Payam Sheikhattari, Rifath Ara Alam Barsha, Emma Shaffer, Istiak Bhuyan and Bethtrice Elliott

Research | 6 April 2023

Family functioning and nicotine dependence among smoking fathers: a cross-sectional study

Yi Guo, Di-yue Liu, Yu-jia Wang, Meng-jie Huang, Nan Jiang, Qiang Hou, Bojunhao Feng, Wen-yu Wu, Yi-bo Wu, Fei Qi and Xin-ying Sun

Research | 6 April 2023

Estimates of disease burden caused by foodborne pathogens in contaminated dairy products in Rwanda

Amanda C. Sapp, Gabriela F. Nane, Mirna P. Amaya, Eugène Niyonzima, Jean Paul Hategekimana, John J. VanSickle, Ronald M. Gordon and Arie H. Havelaar

Research | 6 April 2023

Mental health challenges, treatment experiences, and care needs of post-secondary students: a cross-sectional mixed-methods study

Elnaz Moghimi, Callum Stephenson, Gilmar Gutierrez, Jasleen Jagayat, Gina Layzell, Charmy Patel, Amber McCart, Cynthia Gibney, Caryn Langstaff, Oyedeji Ayonrinde, Sarosh Khalid-Khan, Roumen Milev, Erna Snelgrove-Clarke, Claudio Soares, Mohsen Omrani and Nazanin Alavi

Research | 6 April 2023

Most recent articles RSS ⋙

View all articles ❯

Aims and scope

BMC Public Health is an open access, peer-reviewed journal that considers articles on the epidemiology of disease and the understanding of all aspects of public health. The journal has a special focus on the social determinants of health, the environmental, behavioral, and occupational correlates of health and disease, and the impact of health policies, practices and interventions on the community.

Editorial Board updates

BMC Public Health 2022 22:1802

Research │ Published on: 22 September 2022

> Full Text > PDF

Population health trends analysis and burden of disease profile observed in Sierra Leone from 1990 to 2017

Sierra Leone, in West Africa, is one of the poorest developing countries in the world. Sierra Leone has experienced several recent challenges namely, a civil war from 1991 to 2002, a massive Ebola outbreak fro...

Jolleen Zembe, Flavia Senkubuge, Tanita Botha and Tom Achoki

BMC Public Health 2022 22:1801

Research │ Published on: 22 September 2022

ⓘ The Correction to this article has been published in *BMC Public Health* 2022 **22**:1994

> Full Text > PDF

Predictors of colorectal cancer screening intention based on the integrated theory of planned behavior among the average-risk individuals

This study aimed to determine the predictors of colorectal cancer screening intention based on the integrated theory of planned behavior among average -risk individuals in Urmia. Identifying these predictors w...

Mina Maheri, Baratali Rezapour and Alireza Didarloo

BMC Public Health 2022 22:1800

Research │ Published on: 22 September 2022

> Full Text > PDF

The impact of two state-level approaches to restricting the sale of flavored tobacco products

Flavored tobacco products are highly appealing to youth. The Federal government lacks a comprehensive flavored tobacco products policy and states have adopted

different approaches restricting these products. T...

Tyra Satchell, Megan C. Diaz, Daniel Stephens, Adrian Bertrand, Barbara A. Schillo and Laurie P. Whitsel

BMC Public Health 2022 22:1799

Research | Published on: 22 September 2022

> Full Text > PDF

Health insurance ownership among female workers in Indonesia: does socioeconomic status matter?

Female workers are vulnerable groups in the Indonesian context, and female workers must be responsible for domestic problems and earn a living. The study aimed to analyze the role of socioeconomic on health in...

Agung Dwi Laksono, Wahyu Pudji Nugraheni, Nikmatur Rohmah and Ratna Dwi Wulandari

BMC Public Health 2022 22:1798

Research | Published on: 22 September 2022

> Full Text > PDF

Association between poor self-reported health and unmarried status among adults: examining the hypothesis of marriage protection and marriage selection in the Indian context

The link between marital status and health differences has long been a topic of debate. The substantial research on marriage and health has been conducted under two important hypotheses: marital protection and...

Babul Hossain and K. S. James

BMC Public Health 2022 22:1797

Research | Published on: 22 September 2022

> Full Text > PDF

Development and evaluation of a social marketing campaign to address methamphetamine use in Los Angeles County

This study describes the development and impact of a social marketing campaign in early 2020 intended to prevent and reduce methamphetamine use in Los Angeles County (LAC). We used social marketing principles ...

Deborah Neffa-Creech, Aaron Plant, Jorge A. Montoya, Rangell Oruga, Elizabeth A. Kilgore, Renee Fraser and Lello Tesema

BMC Public Health 2022 22:1796

Research | Published on: 22 September 2022

> Full Text > PDF

Advertising of foods and beverages in social media aimed at children: high exposure and low control

This work is aimed to describe the recent scientific literature developed in the food/beverage sector and social networks aimed at children and adolescents, as well as current regulations.

Lorena Meléndez-Illanes, Cristina González-Díaz and Carlos Álvarez-Dardet

BMC Public Health 2022 22:1795

Research | Published on: 22 September 2022

> Full Text > PDF

Is emotional eating associated with behavioral traits and Mediterranean diet in children? A cross-sectional study

Stress and negative emotions may impact on appetite, inducing some individuals to eat less and others to eat more. This behavior has been implicated in the onset of bodyweight problems and eating disorders in ...

Alessandra Buja, Mariagiovanna Manfredi, Chiara Zampieri, Anil Minnicelli, Roberta Bolda, Filippo Brocadello, Maura Gatti, Tatjana Baldovin and Vincenzo Baldo

BMC Public Health 2022 22:1794

Search

Explore journals   Get published   About BMC   Login
Menu

BMC Public Health

Home   About   Articles   Submission Guidelines   Collections

About ▾

Contact

Editorial board

In Review

Editorial Board

Natalie Pafitis, Senior Editor   [Back to top](#)

Natalie joined BMC after having completed an MSc in Environmental Health at the Cyprus International Institute, in Association with the Harvard School of Public Health, USA where she completed courses including global climate change, environmental epidemiology, sustainable development and exposure assessment. Prior to this, she gained her BSc in Environmental Science at the University of Indianapolis, USA.

Natalie has been Editor of *BMC Public Health* since 2007, also having worked on several biology and medical journals since this time. She has a keen interest in the use of research evidence to underpin public health policy and to advance the Sustainable Development Agenda. She is an Editor of the [BMC Series blog](#) and an ambassador of the Sustainable Development Goals for the BMC Series journals.

Lorena Verduci, Associate Editor

Lorena has a master's degree in Biomolecular Sciences and Technologies (University of Pisa, Pisa, Italy) and a PhD in Innovative Strategies in Biomedical Research (Scuola Superiore Sant'Anna, Pisa, Italy). After her PhD she worked in research institutes, universities and life science companies in Italy and in the UK, including the Italian

National Cancer Institute "Regina Elena" in Rome, "Sapienza" Università di Roma, Rome, Italy, and the University of Cambridge, Cambridge, UK. Her research focused on cardiovascular regeneration, role of microRNAs and circRNAs in cancer, assessment of new cancer drug *in vitro* and *in vivo*, and development of new technologies. Before joining *BMC Public Health* in September 2022, Lorena was an Associate Editor at *PLOS ONE* in the Public Health and Medicine Team.

# Senior Editorial Board Members

Chris I. Ardern

Chris I. Ardern is an Associate Dean of Research and Innovation in the Faculty of Health at York University (Toronto, Canada) and Associate Professor in the School of Kinesiology and Health Science. Chris' primary interest is in the epidemiology of obesity and 24-hour movement behaviors (sleep, sedentary time, and physical activity) in relation to cardiometabolic risk, microvascular dysfunction, and dementia. Most recently, his work has focused on the health risks associated with weight stigma, and the use of risk algorithms and behavioral profiling for the identification of high-risk subgroups of the population. This work incorporates both social and physical determinants, drawing on large scale open data infrastructure, national surveys, and administrative healthcare data to conduct time-to-event and geospatial analyses, to move knowledge into action with collaborating healthcare groups. He holds a Research Scientist position at Southlake Regional Health Centre, is member of the York University Centre for Aging Research and Education (YU-CARE), and is active in obesity organizations at the local to national level. Professor Ardern joined the Editorial Board of *BMC Public Health* in 2017, and has been a Senior Editor since 2019.

Noriko Cable

Noriko is a Senior Research Fellow at the Department of Epidemiology and Public Health, University College London. She works on social relationships, alcohol use and
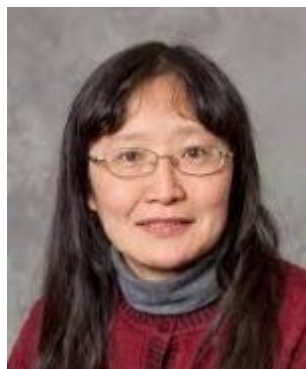
mental health from childhood to late adulthood as well as on cross-national examinations of mental health. Her work appears in the booklets Life gets under your skin and Never too early, never too late published by her research group, the International Centre for Lifecourse Studies in Society and Health (ICLS). She currently works on her ESRC funded project, UK-Japan Social relationships and well-being across ageing nations (UK-Japan SWAN) to establish early career researchers' networks between the UK and Japan. Dr. Cable joined the Editorial Board of *BMC Public Health* as Section Editor in 2019.

Jennifer Emond

Jennifer is Associate Professor in the Departments of Biomedical Data Science and Pediatrics at the Geisel School of Medicine at Dartmouth College and co-Director of the Media & Health Behaviors Laboratory at Dartmouth College. Jennifer's research focuses on the development of health behaviors during early childhood including dietary behaviors, physical activity and sleep. Jennifer's research also examines the role of child-directed food marketing on shaping children's dietary behaviors. She is actively involved in teaching in the Quantitative Biomedical Sciences graduate program at Dartmouth College and greatly enjoys mentoring others within statistical methodology.

Youcheng Liu

Youcheng is currently an Associate Professor at Wayne State University School of Medicine. He trained in medicine and public health with specialties in industrial hygiene, environmental health, occupational health and epidemiology. His research focuses on assessing occupational and environmental exposures to chemical hazards and biological agents, evaluating the resultant health outcomes (asthma, COPD, cardiovascular diseases and diabetes) and identifying effective and feasible measures and strategies to reduce exposures and prevent diseases. Current research projects include dermal exposure to nicotine in migrant tobacco farm workers in Kentucky and the development of a barrier cream

and other intervention methods to reduce exposure and green tobacco sickness, isocyanate exposure in neonates and the identification of user barriers of Powered Air-Purifying Respirators (PAPRs) in health care workers. He joined the Editorial Board of *BMC Public Health* in 2010.

Carol Maher   Back to top

Carol is a Research Professor and Deputy Director of the Alliance for Research in Exercise, Nutrition and Activity (ARENA) at the University of South Australia. Her research focuses on the links between lifestyle behaviors (particularly physical activity, sedentary behavior and sleep) and health and obesity in children and adults. She is particularly interested in technology-based approaches for measuring and improving health behaviors, including wearables, smart devices, apps and online social media. Professor Maher joined the Editorial Board of *BMC Public Health* in May of 2014.

Monica Malta   Back to top

Dr. Monica Malta is a researcher at the Centre for Addiction and Mental Health (CAMH) and a professor at the University of Toronto. She has been engaged in global health research focusing on social and structural factors influencing health inequalities and the impact of gender-based violence among female-identified persons from Latin America. Her work contributed to change local legislations and informed several interventions protecting the rights of people living with HIV, survivors of gender-based violence and the LGBTQ2S community.

Isabelle Niedhammer   Back to top

Isabelle is a Research Director at the French National Institute for Health and Medical Research (INSERM, France). She is currently working at the Research Institute for Environmental and Occupational Health (IRSET-INSERM U1085). Her background is in

occupational health epidemiology. Her research topics are related to occupational and social epidemiology and she is particularly interested in job stress, psychosocial work exposures and workplace violence, and their impact on health, as well as in the contribution of these occupational exposures to social inequalities in health. She is the author of more than 100 publications in international peer-reviewed journals and participated in the writing of 8 books. She joined the Editorial Board of *BMC Public Health* in 2011.

Patrick Palmieri   Back to top

Dr. Patrick Palmieri is a global health expert and research methodologist with more than 20 years work experience in academia and industry. Dr. Palmieri leads two research centers based in South America including the EBHC South America: A JBI Affiliated Group and the South American Center for Qualitative Research. He is a full professor and senior research scientist at the Universidad Norbert Wiener (Peru), where he previously served as Vice Chancellor for Research and Dean of the School of Nursing. In addition, Dr. Palmieri is an adjunct professor in doctoral programs at A.T. Still University and Texas Woman's University. Previously in Peru, he co-led a $300+ million project resulting in the largest private vertically integrated health delivery system and led the first successful international hospital accreditation. His research interests include generating evidence to guide clinical practice through scoping and systematic reviews, applied psychometrics for cross-cultural research, quality improvement projects, and qualitative inquiry. Dr. Palmieri is certified as a senior researcher by the Peruvian National Committee for Science, Technology, and Innovation, and he is a fellow of the American Academy of Nurses and the Royal College of Surgeons in Ireland.

Louisa Peralta   Back to top

Louisa is a Senior Lecturer in the Sydney School of Education and Social Work at the University of Sydney, Australia. With a background in health and physical education,

her research focuses on the design, implementation, and evaluation of school- and community-based health promoting programs (particularly focusing on physical activity) in children, adolescents and postpartum women. She is particularly interested in the implementation processes, including technology platforms, and the impact of these interventions on a range of health knowledge, capabilities, and behaviours. Dr Peralta joined the Editorial Board of *BMC Public Health* in 2018.

David Rehkopf

David is an Assistant Professor of Medicine at Stanford University, in the Division of Primary Care and Population Health, with an appointment in Health Research and Policy, and affiliations with the Stanford Center on Poverty and Inequality and the Stanford Center for Population Health. He received his Masters in Public Health in Epidemiology and Biostatistics from the University of California, Berkeley, and his doctorate at the Harvard School of Public Health in the Department of Health and Social Behavior. He was a Robert Wood Johnson Health and Society Scholar at the University of California, Berkeley and the University of California, San Francisco. His research focus is on understanding the health effects of income and work policy on health, as well as understanding the biological pathways through which the social and economic environment impacts disease and death. He joined the Editorial Board of *BMC Public Health* in 2016.

Akira Shibanuma

Akira is a Lecturer at the Department of Community and Global Health, Graduate School of Medicine, the University of Tokyo. As a social scientist, he has been involved in community health research studies in low- and middle-income countries and Japan. His research mainly focuses on health and healthcare service-seeking behaviors, social determinants of health, and inequity in health in the field of reproductive, maternal, newborn, child, and

adolescent health as well as migration and health. He currently works on research projects regarding discrimination and wellbeing and the quality of healthcare service provisions. He joined the Editorial Board of *BMC Public Health* in 2020.

Henri Tilga
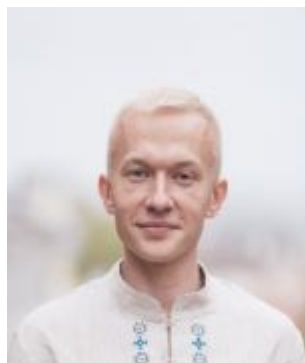
Henri is a Research Fellow of Sports Sciences in the Institute of Sport Sciences and Physiotherapy, University of Tartu. The theoretical background of his work is based mainly on the self-determination theory. More specifically, he works on the topic of teachers' multidimensional autonomy-supportive and controlling behaviours, students' psychological need satisfaction and frustration, and students' autonomous and controlled forms of motivation in the context of physical education. He has also developed and tested the effectiveness of several intervention programs with the aim to improve psychological need satisfaction and autonomous forms of motivation among students in the context of physical education. He joined the Editorial Board of *BMC Public Health* in 2021.

Shankar Viswanathan

Shankar is an Assistant Professor of Biostatistics at the Albert Einstein College of Medicine, in the Department of Epidemiology and Population Health. He received his doctoral degree in Biostatistics from the University of North Carolina at Chapel Hill. His methods research focuses on multivariate survival analysis, longitudinal data, and missing data analysis. His applied area focusses on Global Health, Injury Epidemiology, and Chronic Disease Epidemiology. He joined the Editorial Board of *BMC Public Health* in 2018.

Senior Editorial Board Members

Chris Ardern, *York University, Canada*

Noriko Cable, *University College London, UK*

Jennifer Emond, *Dartmouth College, USA*

Youcheng Liu, *Wayne State University, USA*

RESEARCH

Health insurance ownership among female workers in Indonesia: does socioeconomic status matter?

Agung Dwi Laksono[1], Wahyu Pudji Nugraheni[1], Nikmatur Rohmah[2] and Ratna Dwi Wulandari[3*]

Abstract

Background: Female workers are vulnerable groups in the Indonesian context, and female workers must be responsible for domestic problems and earn a living. The study aimed to analyze the role of socioeconomic on health insurance ownership among female workers in Indonesia.

Methods: The study population was all female workers in Indonesia. This cross-sectional study involved 7,943 respondents. The study analyzed health insurance ownership as an outcome variable and socioeconomic status as an exposure variable. The study also involved five control variables: residence, age, marital, education, and occupation. The research used multinomial logistic regression in the final step.

Results: The results show the poorest female workers have a possibility of 0.735 times more than the richest to have NHI (AOR 0.733; 95% CI 0.733–0.737). The poorer female workers have 0.939 times less likely than the richest to have NHI (AOR 0.939; 95% CI 0.937–0.942). Female workers with middle socioeconomic status are possibly 0.833 times less than the richest to have NHI (AOR 0.833; 95% 0.831–0.835). Moreover, the richer female workers have 1.028 times more likely than the richest to have NHI (AOR 1.028; 95% CI 1.025–1.030). Moreover, all socioeconomic statuses have a lower possibility than the richest of having other health insurance.

Conclusions: The study concluded that socioeconomic has a role in health insurance ownership among female workers in Indonesia.

Keywords: Health insurance, National health insurance, Health policy, Population survey, Public health

Introduction

Women in the Indonesian context are a vulnerable group. Women who work have a dual role: taking care of the household and working to earn a living. Female workers today face conflicting demands from both work and life fields, and women find it challenging to manage and balance workplace pressures and household tasks. Balancing work and household is critical for female workers [1].

Female workers in Indonesia tend to work in the tertiary sector (trade, hotels, restaurants, transportation, finance, communications, leasing, and services) rather than the primary sector (agriculture, mining, and quarrying) [2]. Some barriers to female workers in Indonesia include career disruption due to childbirth and childcare responsibilities, lack of education and skills, low wages, unsupported gender-based regulations, and low support for gender equality [3, 4]. Another study mentions a weakness in married female workers. Married female workers tend to be less patient in the service process; they want to handle complaints quickly and as soon as possible [5]. The double burden of female workers is related to the

*Correspondence: ratna-d-w@fkm.unair.ac.id

[3] Department of Administration and Health Policy, Faculty of Public Health, Universitas Airlangga, Surabaya, Indonesia
Full list of author information is available at the end of the article

Laksono *et al. BMC Public Health*   (2022) 22:1798

Page 2 of 10

physical workload of caring for the house and working as laborers and the psychological responsibility of ridicule for not doing a good job [6, 7]. This situation makes female workers vulnerable to physical and mental conditions; compared to women who only play homemakers, female workers are more prone to illness [6–8]. Once they are sick, and out of work, there is a lost income opportunity. The economic resilience of female workers is really tested when they are sick. For this reason, having health insurance is very important for female workers.

Indonesia has committed to implementing national health insurance (NHI), including supporting the poor [9]. Everyone in Indonesia has the same rights in obtaining access to health sector resources and health services that are safe, quality, and affordable. On the other hand, everyone in Indonesia also must participate in the social health insurance program. To reduce the risk of people bearing health costs out of pocket, in amounts that are difficult to predict and sometimes require very high prices, a guarantee in the form of health insurance is needed. Thus, the health financing is borne jointly by all participants, not to burden each person. But health insurance alone is not enough; we need social health insurance or NHI. Social health insurance applies the principles of cost and quality control, and the situation means that participants can get adequate quality services at reasonable and controlled prices. Social health insurance guarantees certainty of financing for sustainable health services, and we can use it throughout Indonesia. Therefore, the Government of Indonesia has released NHI to address inequality in access and quality of health services, ensuring that all citizens, especially the poor and near-poor, can access quality care without facing financial difficulties [10].

The reported coverage of NHI participation based on a secondary analysis of four nationally representative quantitative data in 2018 states: that self-reported NHI registration (60.6%) is about 10% lower than insurance reports (71.1%). Insurance coverage is highest in poor areas [11]. Based on the integrated monitoring and evaluation system, the Indonesian National Social Security Council reports that the national NHI membership is 86.96%, the Non-Contribution Assistance Recipient (NAR) is 40.4%, and the Contribution Assistance Recipients (CAR) is 59.6%. The government reports participation based on membership segment up to December 2021: workers receiving 25.5% wages; non-wage recipients 13.1%; non-workers 1.9%; central CAR 42.4%; and regional CAR 17.1%. The profiles of wage recipient workers participants up to December 2021 are as follows: civil servants 20.8%), Indonesian national armed forces/republic of Indonesia police/civil servants ministry of defense 4.6%; non-civil servant government employees 5.5%; and private/state-owned enterprises/other employees 68.9%. NHI participation by gender shows almost equal; data reported up to December 2021, 49.5% female and 50.5% male [12]. This data is balanced with the Indonesian population until December 31, 2021; the number of men in Indonesia is more than women. Indonesia's people of the male sex are recorded at 138.3 million people (50.5%) and 135.57 million women (49.5%) [13].

Studies in West Java report that per capita household expenditure, number of unproductive household members, household members, residence status, Gross Domestic Product (GDP) per capita, and agricultural contribution to GDP affect women workers [14]. In comparison, a study in East Java reported that heads of households have a higher probability of working than non-heads of homes. Each increase in family members will reduce women's opportunities to work [15]. In 31 of 34 provinces in Indonesia, women receive fewer wages than men; this will significantly hamper the role of women in poverty alleviation because women workers will find it difficult to achieve financial independence and economic independence [16]. Studies in Belgium and China report that workplace poverty has become chronic, especially among women workers in low-quality jobs [17]. Limited leisure time (time poverty) due to the burden of caregiving can prevent women from fully engaging in the formal economy, limiting productivity and economic growth and encouraging self-neglect [4]. The vulnerability experienced by female workers from low-income families is motivated by weak economic conditions; their husbands generally work modestly and odd jobs. The income earned is insufficient for the family's needs [6].

Women work in very diverse economic sectors. Women work longer hours than men. Women still carry out household responsibilities regardless of employment status [4]. Children of non-professional women workers are at risk of health problems. Children whose mothers worked in agriculture and manual work had a higher chance of experiencing stunting compared to those whose mothers worked in professional jobs [18, 19]. Studies in Peru show that 82.1% of working mothers work for their family members, do not receive remuneration, and are not paid. Children of mothers who do unpaid work are at higher risk of stunting [20]. The chance of stunting in Indonesia increases significantly among children living in households with three or more children under five. The odds also increase significantly with a decrease in the household wealth index [21]. Women's financial autonomy is one of the factors associated with reducing the likelihood of children becoming stunted [22, 23]. In addition to causing time poverty for themselves, female workers also impact their children's health.

Laksono *et al. BMC Public Health*　(2022) 22:1798

Page 3 of 10

Women currently comprise almost half of the national workforce. Female workers make up 70% of mothers with children under 18. The average income for women is 81% of the payment for men [24]. Moreover, employment-based health financing schemes tend to favor men and undermine progress towards universal health coverage. Achieving universal health coverage requires progress financing systems that ensure women access adequate, appropriate, affordable, quality health care. The situation jeopardized access to health care when working with their job requirements, as women face more jobs and transitions throughout their lives, including for reproduction and unpaid work [25, 26]. Female workers in low socioeconomic conditions (poor and near-poor) will have limitations in buying health insurance. Female workers need economic security covering health problems, insurance protection, and paid sick leave [24]. Thus, policymakers must ensure accessibility reduces barriers for women workers to health services. Policymakers must be able to encourage increased NHI participation for women workers. Based on the background, the study aims to analyze the socioeconomic role of ownership of health insurance for female workers in Indonesia.

Materials and methods
Study design and data source
The study design was a cross-sectional study. The study used secondary data from a previous study ("Abilities and Willingness to Pay, Fee, and Participant Satisfaction in implementing National Health Insurance in Indonesia in 2019"). The survey conducted data collection on respondents aged $\geq$ 18 years. This survey aims to determine the ability and willingness to pay contributions, cost reductions, and participants' satisfaction in implementing NHI. The survey was a national-scale survey conducted by the Ministry of Health of the Republic of Indonesia. Through stratification and multistage random sampling. The survey collected 47,644 respondents [27].

Meanwhile, this study population was all female workers in Indonesia. By filtering by gender (female) and employment status (employed), the study described 7,943 respondents. Sample distribution by province can be seen in Table 1—moreover, the distribution of the variables is displayed in Table 2.

Variables
The study employed health insurance ownership as the outcome variable. There are three groups of health insurance ownership: uninsured, NHI, and other health insurance. The survey only asked about the primary type of insurance owned. Meanwhile, the study used socioeconomic as an exposure variable.

Table 1 Sample distribution by province

Province	n	%
Aceh	104	1.3
Sumatera Utara	387	4.9
Sumatera Barat	134	1.7
Riau	106	1.3
Jambi	48	.6
Sumatera Selatan	221	2.8
Bengkulu	53	.7
Lampung	180	2.3
Kep.Bangka Belitung	37	.5
Kepulauan Riau	37	.5
DKI Jakarta	328	4.1
Jawa Barat	1231	15.5
Jawa Tengah	1404	17.7
DI Yogyakarta	131	1.6
Jawa Timur	1458	18.4
Banten	316	4.0
Bali	185	2.3
Nusa Tenggara Barat	197	2.5
Nusa Tenggara Timur	208	2.6
Kalimantan Barat	155	2.0
Kalimantan Tengah	89	1.1
Kalimantan Selatan	139	1.7
Kalimantan Timur	67	.8
Kalimantan Utara	15	.2
Sulawesi Utara	65	.8
Sulawesi Tengah	83	1.0
Sulawesi Selatan	261	3.3
Sulawesi Tenggara	56	.7
Gorontalo	28	.4
Sulawesi Barat	24	.3
Maluku	53	.7
Maluku Utara	19	.2
Papua Barat	29	.4
Papua	95	1.2
Total	7943	100.0

The survey employed the wealth index formula to determine socioeconomic status. The poll formulated the wealth index based on a weighted average of a family's overall spending. Meanwhile, the wealth index was calculated based on primary household expenditures such as health insurance, food, accommodation, and other items. Furthermore, the poll separated the income index by quintile into five categories: the poorest, poorer, middle, richer, and the richest [28–30].

As control variables, the analysis used five variables. The five variables were the type of residence, age group, marital status, education level, and occupation type.

Laksono *et al. BMC Public Health* (2022) 22:1798

Page 4 of 10

Table 2 Variable distribution

Variable	n	%
Health Insurance Ownership		
Uninsured	2030	25.6
NHI	5696	71.7
Other	217	2.7
Wealth status		
Poorest	1950	24.5
Poorer	1529	19.2
Middle	1407	17.7
Richer	1404	17.7
Richest	1653	20.8
Type of Residence		
Urban	2366	29.8
Rural	5577	70.2
Age group		
0—17	87	1.1
18—64	7296	91.9
>64	560	7.1
Marital status		
Never married	1212	15.3
Married	5384	67.8
Divorced/Widowed	1347	17.0
Education Level		
No education	509	6.4
Primary	4374	55.1
Secondary	2105	26.5
Higher	955	12.0
Occupation type		
Civil servant/Police/Army	477	6.0
Private sector	1003	12.6
Entrepreneur	2376	29.9
Farmer/Fisherman/Labor	2749	34.6
Others	1338	16.8

There were two types of residence available: urban and rural. The study split the age group into three classes in the sample: ≤ 17, 18—64, and ≥ 65. Meanwhile, the study divided marital status into three categories: never married, married, and divorced/widowed. There were four levels of education: no education, primary, secondary, and higher education. Moreover, there are five occupation types: civil servant/police/army, private sector, entrepreneur, farmer/fisherman/ labor, and others.

Data analysis

The research employed the Chi-Square test to make a bivariate comparison in the first stage. Next, the researchers used a collinearity test to ensure no intense correlation between independent variables in

the resulting regression model. In the final step, the study employed a multinomial logistic regression. The researchers conducted the last step to explore the multivariable relationship between all independent variables and health insurance ownership as the outcome variable. The researchers employed the IBM SPSS 26 software for the duration of the statistical analysis.

Ethical approval

The study used secondary data from the "Abilities and Willingness to Pay, Fee, and Participant Satisfaction in implementing National Health Insurance in Indonesia in 2019" survey, so it does not require ethical approval. The National Ethics Committee has approved the "Abilities and Willingness to Pay, Fee, and Participant Satisfaction in implementing National Health Insurance in Indonesia in 2019" survey's ethical clearance (Number: LB.0201/2/KE.340/2019). The poll deleted all the identities of respondents from the dataset.

Results

Descriptive results

The study results show that the socioeconomic status distribution among female workers in Indonesia is: the poorest at 25.8%, poorer at 19.6%, middle at 17.3%, richer at 17.4%, and the richest at 19.9. Meanwhile, the distribution is uninsured 26.0%, NHI 71.3%, and other insurance 2.7% based on health insurance ownership.

Table 3 shows the descriptive statistic of the respondents' socioeconomic and individual characteristics. The poorest dominated the uninsured and NHI categories based on health insurance ownership; the richest led the other class.

Regarding the type of residence, the richest occupied the urban area, and on the contrary, the poorest led in the rural area. According to the age group, the poorer dominated in ≤ 17 groups, and the poorest dominated in 18–64 and ≥ 65 groups.

The richest occupied in never married and married categories based on marital status, and meanwhile, the poorest led in the divorced/widowed category. The poorest dominate in no education and primary levels based on education level, while the wealthiest dominate in secondary and higher levels.

Table 3 shows, based on occupation type, the richest led in civil servant/police/army, private sector, and entrepreneur types. Moreover, the poorest conducted in farmer/fisherman/labor and other classes.

Multivariate regression analysis

The collinearity test shows no significant relationship between the independent variables. Furthermore, the tolerance value for all variables is more potent than 0.10,

Laksono *et al. BMC Public Health*   (2022) 22:1798

Page 5 of 10

Table 3 Descriptive statistic of socioeconomic and individual characteristics of respondents in Indonesia, 2019 (*n* = 7,943)

Characteristics	Socioeconomic					p-value
	Poorest (*n* = 1,950)	Poorer (*n* = 1,529)	Middle (*n* = 1,407)	Richer (*n* = 1,404)	Richest (*n* = 1,653)	
Health insurance ownership						< 0.001
Uninsured	32.3%	20.1%	18.5%	14.8%	14.4%	
NHI	23.8%	19.5%	17.0%	18.4%	21.3%	
Others	13.5%	17.9%	11.5%	19.0%	38.1%	
Type of residence						
Urban	13.8%	13.3%	17.2%	22.7%	33.0%	
Rural	30.1%	21.9%	17.3%	15.5%	15.2%	
Age group						< 0.001
≤ 17	24.4%	26.2%	13.9%	19.4%	16.0%	
18—64	23.4%	19.8%	17.7%	18.0%	21.0%	
≥ 65	57.6%	15.2%	11.4%	9.1%	6.8%	
Marital status						< 0.001
Never married	21.4%	16.8%	16.4%	21.5%	23.9%	
Married	21.2%	20.2%	18.6%	18.2%	21.8%	
Divorced/Widowed	48.3%	19.5%	12.6%	10.6%	9.0%	
Education level						< 0.001
No education	49.2%	20.9%	12.1%	11.0%	6.8%	
Primary	32.2%	22.7%	18.9%	14.6%	11.5%	
Secondary	14.4%	16.1%	17.6%	24.4%	27.5%	
Higher	6.1%	11.1%	11.0%	19.3%	52.5%	
Occupation Type						
Civil servant/Police/Army	7.8%	11.2%	11.4%	19.0%	50.6%	
Private sector	11.6%	13.3%	15.4%	24.5%	35.2%	
Entrepreneur	16.8%	17.6%	18.9%	21.7%	24.9%	< 0.001
Farmer/Fisherman/Labor	42.6%	23.5%	16.4%	10.9%	6.6%	
Others	21.8%	22.1%	19.6%	18.4%	18.2%	

and the variance inflation factor (VIF) value for all variables is less than 10.00. According to the findings, the regression model exhibited no multicollinearity, implying that the test's decision-making foundation was sound.

Table 4 shows the multinomial logistic regression of health insurance ownership among female workers in Indonesia. The poorest female workers have a possibility of 0.735 times less than the richest to have NHI (AOR 0.733; 95% CI 0.733–0.737). The poorer female workers have 0.939 times less likely than the richest to have NHI (AOR 0.939; 95% CI 0.937–0.942). Female workers with middle socioeconomic status are possibly 0.833 times less than the richest to have NHI (AOR 0.833; 95% 0.831–0.835). Moreover, the richer female workers have 1.028 times more likely than the richest to have NHI (AOR 1.028; 95% CI 1.025–1.030).

Meanwhile, the poorest female workers are possibly 0.254 times the richest to have other health insurance (AOR 0.254; 95% CI 0.252–0.256). The poorer female workers are 0.495 times less likely than the richest to have

additional health insurance (AOR 0.495; 95% CI 0.492–0.498). Female workers with middle socioeconomic status are possibly 0.320 times less than the richest to have NHI (AOR 0.320; 95% 0.317–0.322). Furthermore, the richer female workers have 0.583 times less likely than the richest to have NHI (AOR 0.583; 95% CI 0.579–0.587).

Furthermore, all control variables also found a significant relationship with health insurance ownership. Female workers who live in urban areas are more likely to have NHI or other health insurance. All age groups have a lower probability than the ≥ 65 age group to have NHI based on age group. On the contrary, all age groups are likelier to have other health insurance than the ≥ 65 age group.

According to marital status, all groups are less likely than divorced/widowed to have NHI and other health insurance. Meanwhile, based on education level, no education and primary have a lower probability than higher education to have NHI and additional health insurance. On the other hand, secondary education has a lower

Laksono *et al. BMC Public Health*   (2022) 22:1798

Page 6 of 10

Table 4 The result of multinomial logistic regression of health insurance ownership among female workers in Indonesia, 2019 (*n* = 7,943)

Predictors	NHI			Others		
	AOR	95% CI		AOR	95% CI	
		Lower Bound	Upper Bound		Lower Bound	Upper Bound
Socioeconomic: Poorest	*0.735	0.733	0.737	*0.254	0.252	0.256
Socioeconomic: Poorer	*0.939	0.937	0.942	*0.495	0.492	0.498
Socioeconomic: Middle	*0.833	0.831	0.835	*0.320	0.317	0.322
Socioeconomic: Richer	*1.028	1.025	1.030	*0.583	0.579	0.587
Socioeconomic: Richest	-	-	-	-	-	-
Residence: Urban	*1.750	1.747	1.754	*1.658	1.650	1.666
Residence: Rural	-	-	-	-	-	-
Age: ≤ 17	*0.250	0.248	0.252	*2.406	2.353	2.460
Age: 18—64	*0.809	0.806	0.812	*1.358	1.342	1.374
Age: ≥ 65	-	-	-	-	-	-
Marital: Never married	*0.887	0.884	0.889	*0.229	0.227	0.231
Marital: Married	0.998	0.996	1.000	*0.490	0.487	0.492
Marital: Divorced/Widowed	-	-	-	-	-	-
Education: No education	*0.871	0.867	0.874	*0.238	0.235	0.242
Education: Primary	*0.924	0.921	0.928	*0.579	0.574	0.583
Education: Secondary	*1.035	1.031	1.038	*1.097	1.089	1.105
Education: Higher	-	-	-	-	-	-
Occupation: Civil servant/Police/ Army	*48.197	47.360	49.049	*12.578	12.317	12.845
Occupation: Private sector	*1.462	1.458	1.467	*1.300	1.290	1.311
Occupation: Entrepreneur	*0.777	0.775	0.779	*0.965	0.959	0.971
Occupation: Farmer/Fisherman/ Labor	*0.886	0.884	0.888	*0.693	0.689	0.698
Occupation: Others	-	-	-	-	-	-

Note: *AOR* Adjusted Odds Ratio, *CI* Confidence interval

* *p* < 0.001

likelihood than higher education of having NHI and other health insurance.

The last result, based on occupation type, civil servant/police/army, and private sector groups have a higher probability than other categories to have NHI and additional health insurance. On the other side, entrepreneurs, farmers/fishers/laborers are less likely to have NHI and other health insurance than different categories.

Discussion

As one of the national development goals, health development aims to realize a healthy lifestyle for everyone and achieve the highest degree of public health. Law Number 40 concerning the National Social Security System (NSSS) in 2004 mandates that social security is something that must be available to all Indonesians, including the National Health Insurance (NHI) through the Social Security Administering Agency (SSAA) [31–33]. One of the obligations and roles of the government through SSAA Health is to provide the fulfillment of health rights to workers as part of the individual health

efforts, which are integrated with the insurance payment scheme facilitated by SSAA Health [33].

SSAA Health data in August 2021 recorded the number of NHI participants reaching 225.96 million. The SSAA targets the National Health Insurance-Healthy Indonesia Card (NHI-HIC) program to get 88.51% of Indonesia's total population in 2022. This coverage is equivalent to the entire membership of 245.14 million people [34]. The study results found that only 71.3% of female workers became NHI participants. Referring to the SSAA target, the total membership coverage for female workers is still deficient. Massive efforts are needed to increase the ownership of health insurance in the worker segment, especially female workers, who biologically have more health risks than male workers due to childbirth.

The study shows that socioeconomic status is associated with health insurance ownership among female workers in Indonesia. The poor female workers (poorer and poorest) have less possibility of having NHI. This phenomenon is natural because a person's financial ability strongly correlates with health insurance ownership

Laksono *et al. BMC Public Health*   (2022) 22:1798

Page 7 of 10

[35]. Every health insurance requires a contribution from all participants, so a person needs to have the income to pay a monthly fee when he wants health insurance [35]. A person in low socioeconomic conditions (poor and near-poor) will have limitations in buying health insurance. The research results in several countries also prove that financial ability significantly correlates with health insurance ownership [32, 36, 37].

Furthermore, all socioeconomic statuses of female workers have less possibility of having other health insurance. Several reasons can explain this phenomenon, including the insufficient knowledge of female workers on the importance of health insurance. This study's data analysis shows that most respondents (49.2%) are uneducated female workers. The results indicate no education and primary have a lower probability than higher education to have NHI and other health insurance. Several studies in various countries also prove that inadequate education is closely related to health insurance ownership [36–38]. In addition, from the health insurance provider perspective, the dissemination of health insurance products and benefits has not been done optimally to all segments of society. Hence, people are not well informed about the benefits and importance of having health insurance. Several other studies evidenced that low participation in health insurance is due to a lack of socialization [39, 40]. Based on a socioeconomic level, all groups generally have a better chance than the richest to have an NHI than other health insurance.

Female workers who live in urban areas are more likely to have NHI or other health insurance. Living in urban areas has a more significant potential to get broad information about everything, including the importance of having health insurance [41, 42]. In urban areas, access to information and health services is much higher than those in rural areas, so understanding people in urban areas about health insurance is better than those in rural areas. The better the understanding of health, the higher a person's tendency to have health insurance [43–45].

The study found that the ≥ 65 age group has the highest likelihood of having NHI. Many studies show that age has a close relationship with health insurance ownership. The older, the more health problems suffer, requiring more health services [37, 46, 47]. However, the AOR of the other insurance ownership decreases as the respondents get older. This condition is possible because the NHI benefits package is better than other insurances. On the other hand, NHI premiums also tend to be cheaper [48]. As health risks increase in the elderly, cheaper and more comprehensive options make more sense, even though they must be sacrificed the conveniences compared to other insurance [49].

The study also informs that all groups are less likely than divorced/widowed to have NHI and other health insurance based on marital status. Literature on health and mortality by marital status has consistently identified that unmarried individuals generally report poorer health and have a higher mortality risk than their married counterparts [7, 50, 51]. So they need more health insurance compared to those who are married. The observations in almost all countries show that families with low or poor economic status have more inadequate health conditions than families with moderate and reasonable economic levels [52–54].

Based on occupation type, the study shows civil servant/police/army has the highest probability of other categories of having NHI. This condition is more of an effect of regulations that include civil servants/police/army as mandatory participants in NHI. Premiums for these purposes are directly deducted from their salaries. While the private sector also has a greater possibility of participating in the NHI because the regulations require employers to bear the NHI premium for their workers [32, 49].

Discuss the social health insurance system in a country or NHI; we must understand that participation is mandatory and binding for the entire population. The principle of NHI is mandatory and cooperation between participants so that the target of NHI is universal health coverage so that the government can distribute the risk more broadly. Each country has a strategy and mechanism for achieving universal health coverage, and Indonesia implements a cross-subsidy policy in the NHI program. The government fully subsidizes the contribution from the state budget for the poor. In contrast, the government's contribution is partially supported (4%), and the rest is taken/deducted from their salary [55–57]. With a mechanism like this, the poor and government employees have a higher chance of having health insurance than other types of work or people with different socioeconomic statuses.

Based on the results, the government needs to be more active in involving employers to increase the ownership of health insurance in the context of the NHI. The main target is workers with a low socioeconomic.

Study limitation

The study strengths analyzed big data as an analysis material to show generalized female workers' pictures up to the national level. Meanwhile, the study limitation utilized secondary data. The variables used are limited to those provided by the Ministry of Health of the Republic of Indonesia. Previous studies found other variables influencing health insurance ownership could not be investigated. These variables are cognitive

Laksono *et al. BMC Public Health*   (2022) 22:1798

Page 8 of 10

capacity, prior commercial insurance ownership, having children, and family size [58–60].

Conclusions

The study concluded that socioeconomic status affects health insurance ownership among female workers in Indonesia. Furthermore, all control variables also indicate a relationship with health insurance ownership among female workers: the type of residence, age group, marital status, education level, and occupation type.

Based on the results, the government needs to be more active in involving employers to increase the ownership of health insurance in the context of the NHI. The main target is workers with a low socioeconomy. On the other hand, the government needs to pay more attention to those who work in the informal sector. Their situation is more vulnerable, with incomes tending to be lower and uncertainty higher.

The government also needs to pay attention to female workers with middle wealth status. For the poorest female workers, the government has included them in the CAR mechanism. Meanwhile, female workers with moderate wealth must pay their own NHI premiums. When they are in good health, the contribution is not a problem, and it's different when their condition is sick; the amount of the NHI premium becomes heavy.

Abbreviations
NHI: National Health Insurance; NAR: Non-Contribution Assistance Recipient; CAR: Contribution Assistance Recipients; NSSS: National Social Security System; SSAA: Social Security Administering; NHI-HIC: National Health Insurance-Healthy Indonesia Card; AOR: Adjusted odds ratio; VIF: Variance Inflation Factor.

Authors' contributions
ADL developed the proposal, analyzed, and interpreted the patient data. WPN and NR were significant contributors in conducting the study, interpreting the data, and writing the manuscript. RDW was a substantial contributor in conducting the study, analyzing the data, and writing the manuscript. All authors read and approved the final manuscript.

Availability of data and materials
The author cannot publicly share the data because a third party and authors who own the data do not have permission to share the data. The survey data set requested from the National Institute of Health Research and Development of the Indonesia Ministry of Health is available via https://www.litbang.kemkes.go.id/layanan-permintaan-data-riset/ for researchers who meet the criteria for access to confidential data.

Declarations

Ethics approval and consent to participate
The study used secondary data from the "Abilities and Willingness to Pay, Fee, and Participant Satisfaction in implementing National Health Insurance in Indonesia in 2019" survey, so it does not require ethical approval. The Ethics Committee in National Institute of Health Research and Development has approved the "Abilities and Willingness to Pay, Fee, and Participant Satisfaction in implementing National Health Insurance in Indonesia in 2019" survey's ethical clearance. The current study has an ethical waiver statement from the Ethics Committee in the National Institute of Health Research and Development (Number: LB.0201/2/KE.340/2019).
Each participant gave written informed consent after being assured that their information would be kept private and used exclusively for research reasons. The survey followed all procedures in compliance with the applicable norms and legislation. The poll deleted all the identities of respondents from the dataset.

Consent for publication
Not applicable.

Competing interests
The authors declare that they have no competing interests.

Author details
[1]National Research and Innovation Agency Republic of Indonesia, Jakarta, Indonesia. [2]Faculty of Health Science, Muhammadiyah University of Jember, East Java, Indonesia. [3]Department of Administration and Health Policy, Faculty of Public Health, Universitas Airlangga, Surabaya, Indonesia.

References
1. Bharadwaj MV, Shanker M. Women at workplace and work life balance: a literature review. Semcom Manag Technol Rev. 2019;7(1):46–59.
2. Wijayanto AY, Wulan SD. Analysis of decision to work of female workers in Indonesia. Econ Dev Anal J. 2019;8(3):290–300.
3. Ismalina P. Women workers in the Indonesian labor market: inevitable marginalization. J Peremp. 2018;23(4):235–47.
4. Hyde E, Greene ME, Darmstadt GL. Time poverty: Obstacle to women's human rights, health and sustainable development. J Glob Health. 2020;10(2):1–5.
5. Hakim L, Ma'ruf MH, Aditiya PY, Riko H, Yuli S. Model profit economic on female workers in indonesia. J Int Ris Ekon Bisnis dan Akunt. 2021;5(02):92–103.
6. Chandra KY, Fatmariza F. Double burden: women's vulnerability in poor families (Beban Ganda: Kerentanan Perempuan Pada Keluarga Miskin). J Civ Educ. 2020;3(4):430–9.
7. Megatsari H, Laksono AD, Herwanto YT, Sarweni KP, Geno RAP, Nugraheni E, et al. Does husband/partner matter in reduce women's risk of worries?: Study of psychosocial burden of covid-19 in indonesia. Indian J Forensic Med Toxicol. 2021;15(1):1101–6.
8. Kusrini I, Fuada N, Supadmi S, Laksono AD. Education as predictor of low birth weight among female worker in Indonesia. Medico-Legal Updat. 2021;21(1):360–5.
9. Adyas A. The Indonesian strategy to achieve universal health coverage through national health insurance system: its challenges in human resources. Kesmas Natl Public Heal J. 2021;16(4):221–7.
10. The Ministry of Health of The Republic of Indonesia. Handbook of National Health Insurance for Key Populations (Buku Panduan Jaminan Kesehatan Nasional Bagi Populasi Kunci). www.jkn.kemkes.go.id. Jakarta Indonesia; 2016. 3–4 p.
11. Pratiwi AB, Setiyaningsih H, Kok MO, Hoekstra T, Mukti AG, Pisani E. Is Indonesia achieving universal health coverage? Secondary analysis of national data on insurance coverage, health spending and service availability. BMJ Open. 2021;11(10):1–20.

Laksono *et al. BMC Public Health*   (2022) 22:1798

Page 9 of 10

12. National Social Security Council of the Republic of Indonesia. Aspects of Indonesian National Social Security Participation. National Social Security Council Integrated Monitoring and Evaluation System (Aspek Kepesertaan Jaminan Sosial Nasional Indonesia). Sistem Monitoring dan Evaluasi Terpadu Dewan Jaminan Sosial Nasional. 2022. p. 1. Available from: http://sismonev.djsn.go.id/ [cited 2022 Aug 12]

13. Ministry of Home Affairs of the Republic of Indonesia. Indonesia's Population Reaches 273 Million People by the End of 2021 (Jumlah Penduduk Indonesia Capai 273 Juta Jiwa pada Akhir 2021). databoks. 2022. p. 1.

14. Damayanti K. Determinants of women working in West Java (Determinan perempuan bekerja di Jawa Barat). J Kependud Indones. 2021;16(1):55.

15. Tsaniyah AH, Sugiharti L. The determinants of women's work: a case study in East Java. J Ilmu Ekon Ter. 2021;6(1):66–81.

16. Iskandar Y, Hamid A. A spatial review of wages by gender and its relation to the gender equality and equity index in Indonesia (Tinjauan Spasial Upah Menurut Jenis Kelamin dan Kaitannya Dengan Indeks Kesetaraan dan Keadilan Gender di Indonesia). J Bisnisman Ris Bisnis dan Manaj. 2019;1(2):1–19.

17. Liu J. What does in-work poverty mean for women: comparing the gender employment segregation in Belgium and China. Sustain. 2019;11(20):5725.

18. Nankinga O, Kwagala B, Walakira EJ. Maternal employment and child nutritional status in Uganda. PLoS ONE. 2019;14(12):1–14.

19. Huriah T, Handayani P, Sudyasih T, Susyanto BE. The determinant factors of stunting among children in urban slums area, Yogyakarta, Indonesia. Open Access Maced J Med Sci. 2021;9(T4):1–5.

20. Chavez-Zarate A, Maguiña JL, Quichiz-Lara AD, Zapata-fajardo PE, Mayta-tristán P. Relationship between stunting in children aged 6 to 36 months and employment status of mothers in Peru; a sub-analysis of the peruvian demographic and health survey. PLoS One. 2019;14(4):1–16.

21. Titaley CR, Ariawan I, Hapsari D, Muasyaroh A. Determinants of the stunting of children in indonesia : a multilevel analysis of the 2013 indonesia basic health survey. Nutrients. 2019;11:1160.

22. Kumar R, Lakhtakia S. Women' empowerment and child stunting in india: an investigation. J Popul Soc Stud. 2021;29:47–66.

23. Shirisha P, Bansal A. Is mother's financial autonomy associated with stunting among children aged 7–35 months: an empirical study from India. PLOS Glob Public Heal. 2022;2(1):e0000134.

24. The Henry J. Kaiser Family Foundation. Women, Work, and Family Health: Key Findings from the 2017 Kaiser Women's Health Survey. Women's Heal Policy. 2018;(March):1–6.

25. Vijayasingham L, Govender V, Witter S, Remme M. Employment based health financing does not support gender equity in universal health coverage. BMJ Women's Heal Gend Inequalities. 2020;371(m3384):1–5.

26. Denny HM, Laksono AD, Matahari R, Kurniawan B. The determinants of four or more antenatal care visits among working women in Indonesia. Asia-Pacific J Public Heal. 2022;34(1):51–6.

27. Muas I, Opitasari C, Indah RM, et al. Research Report: Abilities and Willingness to Pay, Fee, and Participant Satisfaction in implementing National Health Insurance in Indonesia in 2019 (Laporan Penelitian: Kemampuan dan Kemauan untuk Membayar Iuran, Urun Biaya serta Kepuasan Peserta dalam Pe. Jakarta, Indonesia; 2019.

28. Rutstein SO. Steps to constructing the new DHS Wealth Index. 2017. p. 1–77. Available from: https://dhsprogram.com/programming/wealth index/Steps_to_constructing_the_new_DHS_Wealth_Index.pdf [cited 2022 Jul 14]

29. Laksono AD, Paramita A, Wulandari RD. Socioeconomic disparities of facility-based childbirth in Indonesia. Int Med J. 2020;25(1):291–8.

30. Wulandari RD, Qomarrudin MB, Supriyanto S, Laksono AD. Socioeconomic disparities in hospital utilization among elderly people in Indonesia. Indian J Public Heal Res Dev. 2019;10(11):1800–4.

31. Nugraheni WP, Hikmatuz Zahroh A, Hartomo RK, Nugraha RR, Chun CB. National health insurance deficit in indonesia: identification of causes and solutions for resolution. Glob J Health Sci. 2020;12(13):58–66.

32. Laksono AD, Wulandari RD, Matahari R. The determinant of health insurance ownership among pregnant women in Indonesia. BMC Public Health. 2021;281(1):1538.

33. Nasution SK, Mahendradhata Y, Trisnantoro L. Can a national health insurance policy increase equity in the utilization of skilled birth attendants in indonesia? A secondary analysis of the 2012 to 2016 national socio-economic survey of Indonesia. Asia-Pacific J Public Heal. 2020;32(1):19–26.

34. Social Security Administering Agency for Health. BPJS Health Kaleidoscope 2021: Closing the Year with Brilliant Performance (Kaleidoskop BPJS Kesehatan 2021: Menutup Tahun dengan Kinerja Gemilang). Badan Penyelenggara Jaminan Sosial Kesehatan. 2022. Available from: https://bpjs-kesehatan.go.id/bpjs/ [cited 2022 Mar 10]

35. Dartanto T, Pramono W, Lumbanraja AU, Siregar CH, Bintara H, Sholihah NK, et al. Enrolment of informal sector workers in the national health insurance system in Indonesia: a qualitative study. Heliyon. 2020;6(11):e05316.

36. Yaya S, Da F, Wang R, Tang S, Ghose B. Maternal healthcare insurance ownership and service utilisation in Ghana: analysis of Ghana demographic and health survey. PLoS ONE. 2019;14(4):1–13.

37. Nguyen TA, Giang LT. Factors influencing the vietnamese older persons in choosing healthcare facilities. Heal Serv Insights. 2021;14:1–14.

38. Lavers T. Aiming for universal health coverage through insurance in ethiopia: state infrastructural power and the challenge of enrolment. Soc Sci Med. 2021;282(June):114174.

39. Suprianto A, Mutiarin D. Evaluation of the implementation of national health insurance. J Gov Public Policy. 2017;4(1):71–107.

40. Herawati H, Franzone R, Chrisnahutama A. Universal Health Coverage: Tracking Indonesia's Progress. Jakarta: Perkumpulan PRAKARSA; 2020. 1–69.

41. Wulandari RD, Laksono AD, Rohmah N. Urban-rural disparities of antenatal care in South East Asia: a case study in the Philippines and Indonesia. BMC Public Health. 2021;21(1):1221.

42. Laksono AD, Wulandari RD, Soedirham O. Urban and rural disparities in hospital utilization among Indonesian adults. Iran J Public Health. 2019;48(2):247–55.

43. Laksono AD, Wulandari RD, Efendi F. Determinants of hospital utilisation among urban poor societies in Indonesia. Int J Innov Creat Chang. 2020;12(9):375–87.

44. Seran AA, Antaria MD, Haksama S, Setijaningrum E, Laksono AD, Prahastuti Sujoso AD. Disparities of the use of hormonal and non-hormonal contraceptive drugs in urban and rural areas in Indonesia and the world. Syst Rev Pharm. 2020;11(9):66–73.

45. Laksono AD, Rukmini RWR. Regional disparities in antenatal care utilization in Indonesia. PLoS One 2. 2020;15(2):e022.

46. Shimels T, Kassu RA, Bogale G, Bekele M, Getnet M, Getachew A, et al. Magnitude and associated factors of poor medication adherence among diabetic and hypertensive patients visiting public health facilities in Ethiopia during the COVID-19 pandemic. PLoS One. 2021 Apr;16(4).

47. Lin Y, Chu C, Chen Q, Xiao J, Wan C. Factors influencing utilization of primary health care by elderly internal migrants in China: the role of social contacts. BMC Public Health. 2020;20(1):1–10.

48. Sahoo H, Govil D, James KS, Prasad RD. Health issues, health care utilization and health care expenditure among elderly in India: Thematic review of literature. Aging Heal Res. 2021;1(2):100012.

49. Laksono AD, Nantabah ZK, Wulandari RD, Khoiri A, Tahangnacca M. Barriers to Expanding the National Health Insurance Membership in Indonesia: Who Should the Target? J Prim Care Community Heal. 2022;13.

50. Akiyama N, Shiroiwa T, Fukuda T, Murashima S, Hayashida K. Healthcare costs for the elderly in Japan: analysis of medical care and long-term care claim records. PLoS ONE. 2018;13(5):1–15.

51. Laksono AD, Wulandari RD. The barrier to maternity care in rural Indonesia. J Public Heal. 2022;30(1):135–40.

52. Laksono AD, Wulandari RD, Rukmini R. The determinant of healthcare childbirth among young people in Indonesia. J Public health Res. 2021;10(1):28–34.

53. Pandey KR, Yang F, Cagney KA, Smieliauskas F, Meltzer DO, Ruhnke GW. The impact of marital status on health care utilization among Medicare beneficiaries. Med (Baltimore). 2019;98(12-p e14871):1–8.

54. Konda SR, Gonzalez LJ, Johnson JR, Friedlander S, Egol KA. Marriage status predicts hospital outcomes following orthopedic trauma. Geriatr Orthop Surg Rehabil. 2020;11:1–5.

55. Wulandari RD, Laksono AD, Matahari R. The effects of health insurance on maternity care in health services in Indonesia. Int J Innov Creat Chang. 2020;14(2):478–97.

56. Nugraheni WP, Hidayat B, Nadjib M, Pambudi ES, Kosen S, Trihandini I, et al. Impact evaluation of national health insurance toward access hospital inpatient care in Indonesia. Indian J Public Heal Res Dev. 2018;9(2):196–200.

57. Maharani C, Rahayu SR, Marx M, Loukanova S. The national health insurance system of Indonesia and primary care physicians' job satisfaction: a prospective qualitative study. Fam Pract. 2022;39(1):112–24.
58. McGarry BE, Tempkin-Greener H, Grabowski DC, Chapman BP, Li Y. Consumer decision-making abilities and long-term care insurance purchase. J Gerontol - Ser B Psychol Sci Soc Sci. 2018;73(4):e1-10.
59. Wang Q, Abiiro GA, Yang J, Li P, De Allegri M. Preferences for long-term care insurance in China: results from a discrete choice experiment. Soc Sci Med. 2021;281:114104.
60. Alo CN, Okedo-Alex IN, Akamike IC. Determinants of willingness to participate in health insurance amongst people living with HIV in a tertiary hospital in South-East Nigeria. Niger Postgrad Med J. 2020;27(3):196–201.

Publisher's Note