Determinants of healthcare utilization under the Indonesian national health insurance system – a cross-sectional study

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Abstract

Background Indonesia has implemented a series of healthcare reforms including its national health insurance scheme (Jaminan Kesehatan Nasional, JKN) to achieve universal health coverage. However, there is evidence of inequitable healthcare utilization in Indonesia, raising concerns that the poor might not be benefiting fully from government subsidies. This study aims to identify factors affecting healthcare utilization in Indonesia.

Methods This study analysed cross-sectional survey data collected by the "Equity and Health Care Financing in Indonesia" (ENHANCE) Study. Andersen's behavioural model of health services use was adopted as a framework for understanding healthcare utilization in Indonesia. Sociodemographic variables were categorized into predisposing, enabling and need factors. Outcome measures included the utilization of primary and secondary health services. Multi-level logistic regression models were run to examine factors associated with each type of health service utilization.

Results Of the 31,864 individuals included in the ENHANCE survey, around 14% had used outpatient services in the past month. Fewer than 5% of the study population had visited hospitals for inpatient care and about 23% used maternal and child health services in the past 12 months. Age, gender and self-rated health were key determinants of health services utilization. No significant differences in primary care utilization were found among people with different insurance status, but people who received subsidised premiums under the JKN were more likely to receive primary care from public health facilities and less likely from private health facilities. Compared to people who pay JKN insurance premiums themselves, the uninsured and those whose premiums were subsidised by the government were less likely to visit public and private hospitals when other factors were controlled.

Conclusion This study demonstrates that the distribution of healthcare utilization in Indonesia is largely equitable as predisposing factors (age and gender) and health need were found to greatly influence the utilization of different types of health services. However, enabling factors such as health insurance status were also found to be associated

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with inequity in utilization of hospital services. Further policy actions regarding resource allocation and health service planning are warranted to achieve a more equitable pattern of health service use in Indonesia.

Keywords   Healthcare utilization, Jaminan Kesehatan Nasional, Indonesia, Andersen's behavioural model

Background

Health equity is defined by the World Health Organization (WHO) as the fair opportunity for everyone to attain their full health potential regardless of demographic, social, economic or geographic strata [1]. It aligns with the guiding principle of "leaving no one behind", central to the 2030 Agenda for Sustainable Development adopted by the United Nations (UN) in 2015 [2, 3]. To achieve better health for all, in addition to interventions which address social and economic determinants of health, the Agenda calls for universal health coverage (UHC) to facilitate access to quality healthcare without financial hardship [3], so that households can be protected against catastrophic health payments and impoverishment.

Indonesia has implemented a series of UHC-driven healthcare reforms fueled by economic growth over the past decade [4]. Before the COVID-19 pandemic, gross domestic product (GDP) in Indonesia was growing at an annual rate of around 5% - one of the highest rates in Southeast Asia [5]. Efforts to promote UHC in Indonesia date back to 1998 when the pro-poor Social Safety Net (Jaringan Pengaman Sosial) programs were launched in response to the 1997 Asian financial crisis [6]. In early 2014, the government rolled out the National Health Insurance scheme (Jaminan Kesehatan Nasional, JKN), which is the largest single-payer system in the world. Under the scheme the poorest 40% of the population (who are deemed incapable of contributing) are identified by the Ministry of Social Affairs and their JKN premiums are fully subsidized by the central, provincial, city or district governments. The JKN mandates that all wage earners (formal sector employees) contribute 1% of their payroll to the JKN with employers required to provide matching funding of an additional 4% of their employees' wages. Non-wage earners not eligible for a subsidy may voluntarily pay a fixed contribution rate, at three different levels, Indonesian Rupiah (IDR) 42,000, 100,000 and 150,000 per person per month, based on the choice of ward class selected by the person [7]. Under the JKN scheme, the capitation model and Indonesian Case Base Groups (INA-CBG) are used to reimburse primary healthcare providers and hospitals respectively [8]. JKN members are not expected to pay out-of-pocket expenditures when they attend health facilities operated within the JKN network. The government has set a policy goal to have all Indonesians covered under the JKN by 2024 [9].

However, full population coverage does not necessarily guarantee equal utilization of healthcare for equal need. Erlangga et al. evaluated the early impact of the JKN using data from the Indonesian Family Life Survey (IFLS) in 2007 and 2014 [10]. They found that the program increased the utilization of outpatient and inpatient care among those who paid JKN premiums themselves. For those whose JKN premiums were subsidised by the government, the increased use was observed only in public and private inpatient care and the magnitude was smaller than for non-subsidised members, implying that the former are unlikely to be benefiting fully from government subsidies. In another study analysing IFLS 2007 and 2014 survey data, large socioeconomic inequalities in healthcare utilization were identified in secondary and preventive care [11]. A study using the 2017 Indonesia Demographic and Health Survey found that women insured under the JKN experienced improved access to maternal healthcare compared with those who were uninsured, but large differences in utilization among those insured were reported across regions and economic subgroups [12]. Laksono et al. also identified regional disparities in hospital utilization after analysing data from the 2018 Indonesian Basic Health Survey [13].

Although previous analyses have indicated potential inequity in health utilization following the implementation of the JKN, those studies were limited either by using data from only the first year of the JKN [10, 11], or by focusing exclusively on one type of health service [12, 13]. Given that equity is the cornerstone of UHC policy reforms like the JKN, it is important to have more recent data on the pattern of healthcare utilization and factors affecting equity in utilization. In this study, we aimed to measure the determinants of healthcare utilization in the JKN era using data from one of the most recent and comprehensive household surveys undertaken in Indonesia. Our goal is to inform future health policies on the design and implementation of the JKN, ensuring equitable healthcare utilization as the country moves along the path to UHC.

Methods

Study setting

As the world's largest archipelago and fourth most populous nation, Indonesia is home to more than 300 ethnic and 730 language groups. With rapid economic

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growth, health expenditure per capita has been growing steadily since 2000 [14]. In 2024, the government budget al.location for health is planned to reach 5.6% of state expenditure [15]. The reliance on out-of-pocket (OOP) payments has decreased in recent years, but OOP health spending still represented about one third of total health expenditure in 2020 [16].

Health service delivery in Indonesia is organized at five levels: village, subdistrict, district, province, and central [17]. Primary care facilities in Indonesia include public health centres (puskesmas) and private ones (e.g. private clinic, private pharmacy, private general practitioners (GPs)/nurse/midwife and private dentist). In theory, patients can visit both public and private health facilities within the JKN network without co-payments. Visits to health facilities that do not contract with the Social Security Agency of Health (Badan Penyelenggara Jaminan Sosial Kesehatan, BPJS Kesehatan) require full OOP payment except in the case of medical emergencies [18]. Both public and private primary care facilities act as gatekeepers and refer patients to hospitals for further treatment. Hospital treatment costs for referred patients are covered by the JKN program under the INA-CBG payment scheme.

The overall health of Indonesians has improved significantly over the past three decades with life expectancy increasing from 62.3 to 68 years between 1990 and 2021 [19]. Morbidity and mortality due to communicable, maternal, neonatal and nutritional causes decreased significantly between 1990 and 2016 [20]. While communicable diseases remain the main source of disease burden in Indonesia, non-communicable diseases have increased significantly between 1990 and 2019 [21]. Meanwhile, widespread geographical variation in the prevalence of non-communicable diseases, health services provision, and health outcomes such as new-born health have been reported across Indonesia [22, 23].

About 60% of Indonesia's population live on Java island [24], which is the fifth largest island in the country. Over half of Indonesia's doctors work on the islands of Java and Bali, serving only 6.9% of the total area of Indonesia [25]. In Papua, the largest and easternmost province of Indonesia, over 50% of puskesmas do not have sufficient doctors [26]. In terms of health infrastructure, Indonesia has seen a rapid growth in primary and secondary health facilities in the past two decades, but the distributions of health centres and hospitals remain unequal [25, 27]. The average ratio of puskesmas per sub-district in Indonesia is 1.4, but is 7.2 in the Jakarta Capital Special Region compared to below 1 in Papua and West Papua [26]. This suggests limited access to public primary healthcare in some remote areas of Indonesia.

Data source

This study used survey data collected by the "Equity and Health Care Financing in Indonesia" (ENHANCE) Study [28] (see supplementary file for the English version of the survey). The ENHANCE survey was conducted in 10 of the 34 provinces in Indonesia which accounted for about 74% of the Indonesian population (North Sumatera (Sumatera Utara), South Sumatera (Sumatera Selatan), Lampung, DKI Jakarta, West Java (Jawa Barat), Central Java (Jawa Tengah), East Java (Jawa Timur), Banten, East Kalimantan (Kalimantan Timur), South Sulawesi (Sulawesi Selatan)). Provinces were deliberately chosen to represent various socioeconomic and demographic factors, such as population size and geographical location, across Indonesia. The selection of districts within provinces was based on geographic location (rural/urban) [29] and a fiscal capacity index (FCI) as defined by the Indonesian Ministry of Finance [30]. In the study provinces, households were selected using a systematic random sampling procedure. First, three districts were selected from each of the ten sample provinces and then classified as having either high, moderate, or low fiscal capacity based on the Regional Fiscal Capacity Map [30]. In each selected district, two sub-districts and four villages (two villages per sub-district) were randomly sampled using a list of sub-districts and villages. Finally, in each village, two enumeration areas were selected from which households were proportionally selected. An e-questionnaire was designed to collect basic demographic and socioeconomic information, as well as data on health service use, costs of health service utilization and type of health facility at the individual level. The questionnaire was administered to households by field teams who were trained in e-data collection and administrative procedures including the content of the questionnaire and how to save completed interviews. Full details of the sampling procedure and data collection techniques are published elsewhere [28]. The first wave of data collection occurred from February to April 2018, and the second wave was carried out from August to October 2019. Overall, 7,554 households and 31,864 individuals were included in the first wave. Only 6,445 households could be traced and re-interviewed in the second wave. In this study, we analysed individual-level data collected from first wave for a larger sample size.

Conceptual framework

This study used Andersen's behavioural model of health service use as a framework for understanding healthcare

utilization in Indonesia [31–33]. Developed in 1968, Andersen's model was originally designed to facilitate the understanding of data collected by the national health surveys in the US, and has become the most frequently adopted model in the literature to investigate access to and utilization of health services [34–36]. An advantage of Andersen's model is that it provides an overarching framework for multivariate analyses [33]. The framework suggests that people's utilization of healthcare is determined by need, and pre-disposing and enabling characteristics at both the contextual and individual levels. An underlying assumption of Andersen's model is that equitable access occurs 'when predisposing demographic and health need variables account for most of the variance in utilization, whereas inequitable access occurs when social structure, health beliefs, and enabling resources determine who gets medical care' [33].

In this study, predisposing characteristics were defined as age group and gender (Fig. 1). Interaction between age group and gender was fitted in the models to test whether health service use differs between males and females and by age. The need factor was informed by the one survey question that asked respondents to self-rate their health status as being 'very healthy', 'somewhat healthy', 'somewhat unhealthy' or 'unhealthy'. The geographic enabling factors were the area of residence (urban or rural). The non-geographic enabling factors included in the survey were education level, proportion of household members employed (i.e., in full-time or part-time employment, self-employed), asset quintiles and health insurance status. The updated Andersen model included quality of care as an enabling factor for assessing healthcare utilization [33]. However, since our survey did not collect information on perceived quality of care or structural measures of quality such as the number of doctors per district, quality of care was not included in the model.

Data analysis

Logistic regression models were run to examine factors associated with each type of health service utilization. The dependent variables were: health service utilization at primary care facilities (puskesmas, private clinic, private pharmacy, private GP/nurse/midwife and private dentist) in the past month; outpatient service utilization at public hospitals in the past month; inpatient service utilization at public hospitals in the past year; inpatient service utilization at private hospitals in the past year; and maternal and child health services (family planning services, antenatal care, normal delivery and associated services, postnatal care, vaccination services for women and children) in the past year. The independent variables included pre-disposing factors (age, gender), enabling factors (area of residence, education level, proportion of household members employed, household asset quintiles and health insurance status) and a need factor (self-rated health). Since the survey data were collected across different geographic levels (province, district, village, enumeration area) while the outcome was measured at the individual level, a multi-level regression model was applied to account for possible clustering and to avoid overestimating the precision of the estimates [37]. Three levels (individual, household, and district) were included in the regression models. Variance partition coefficients (VPCs) were calculated to determine the proportion of the total variance attributable to a particular level in the model. Stata SE version 15.1 was used for data management and analysis (College Station, TX). A *p*-value smaller than 0.05 was considered statistically significant.

Results

Sociodemographic characteristics

Of the total 31,864 individuals included in the first wave of ENHANCE data collection, 19,722 individuals lived in urban areas, while the remaining 12,142 individuals in rural areas (Table 1). There was a significant difference in age distribution between urban and rural areas,
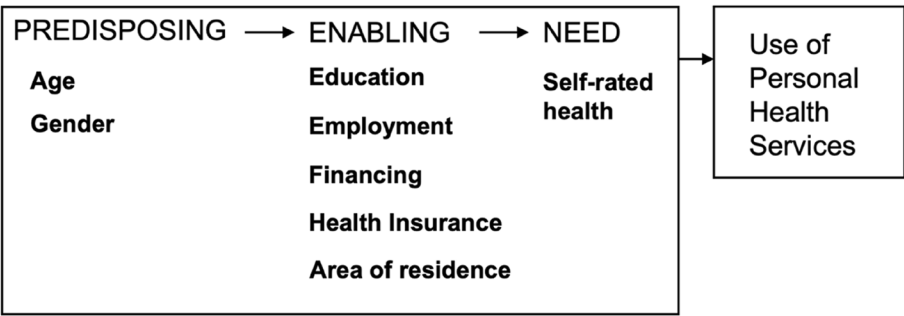

Fig. 1 Andersen's behavioural model

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Table 1 Demographic and socio-economic characteristics by location (urban and rural)

	Urban (*n* = 19,722)	Rural (*n* = 12,142)	Total (*n* = 31,864)	*p*
Individual-level Variables				
Any visit to outpatient service provider in the last month[a]				
Didn't use	16,909 (85.7%)	10,473 (86.3%)	27,382 (85.9%)	0.197
Outpatient at public hospital	320 (1.6%)	103 (0.8%)	423 (1.3%)	**< 0.001**
Health centre/health post	1,113 (5.6%)	516 (4.2%)	1,629 (5.1%)	**< 0.001**
Private hospital/clinic	490 (2.5%)	221 (1.8%)	711 (2.2%)	**< 0.001**
Private pharmacy/drug store	402 (2.0%)	157 (1.3%)	559 (1.8%)	**< 0.001**
Private GP/Nurse/Midwife	791 (4.0%)	787 (6.5%)	1,578 (5.0%)	**< 0.001**
Treatment at home	79 (0.4%)	55 (0.5%)	134 (0.4%)	**0.355**
Private dentist	12 (0.1%)	9 (0.1%)	21 (0.1%)	**0.593**
Any visit to inpatient service in the last 12 months				
Didn't use	18,750 (95.1%)	11,643 (95.9%)	30,393 (95.4%)	**< 0.001**
Public facility	610 (3.1%)	262 (2.2%)	872 (2.7%)	**< 0.001**
Private facility	357 (1.8%)	237 (2.0%)	594 (1.9%)	**0.364**
Any maternal and child health service use in the past 12 months[b]				
Yes	4,382 (22.2%)	2,859 (23.5%)	7,241 (22.7%)	**0.006**
Age groups	**Pre-disposing factor**			0.013
< 5	1,430 (7.3%)	913 (7.5%)	2,343 (7.4%)	
5–14	3,628 (18.4%)	2,382 (19.6%)	6,010 (18.9%)	
15–39	7,777 (39.4%)	4,655 (38.3%)	12,432 (39.0%)	
40–59	4,993 (25.3%)	3,002 (24.7%)	7,995 (25.1%)	
≥ 60	1,831 (9.3%)	1,161 (9.6%)	2,992 (9.4%)	
	Pre-disposing factor			
Female	9,948 (50.4%)	6,114 (50.4%)	16,062 (50.4%)	0.877
	Need factor			
Self-rated health				0.003
Very healthy	13,005 (65.9%)	7,906 (65.1%)	20,911 (65.6%)	
Somewhat healthy	5,286 (26.8%)	3,424 (28.2%)	8,710 (27.3%)	
Somewhat unhealthy	1,191 (6.0%)	688 (5.7%)	1,879 (5.9%)	
Unhealthy	118 (0.6%)	83 (0.7%)	201 (0.6%)	
	Enabling factor			
Completed secondary school[c]	8,557 (43.4%)	3,867 (31.8%)	12,424 (39.0%)	**< 0.001**
Household-level Variables	**Enabling factor**			
Proportion employed in household[d]				**< 0.001**
< 20%	7,891 (40.0%)	6,603 (54.4%)	14,494 (45.5%)	
20–49%	8,286 (42.0%)	4,162 (34.3%)	12,448 (39.1%)	
>=50%	3,545 (18.0%)	1,377 (11.3%)	4,922 (15.4%)	
Asset quintiles				**< 0.001**
1st	3,773 (19.1%)	2,161 (17.8%)	5,934 (18.6%)	
2nd	3,727 (18.9%)	2,520 (20.8%)	6,247 (19.6%)	
3rd	3,780 (19.2%)	2,597 (21.4%)	6,377 (20.0%)	
4th	4,239 (21.5%)	2,567 (21.1%)	6,806 (21.4%)	
5th – highest	4,203 (21.3%)	2,297 (18.9%)	6,500 (20.4%)	
Insurance status of household head[e]				
PBI/KIS (insurance for the poor)	9,791 (49.6%)	4,801 (39.5%)	14,592 (45.8%)	**< 0.001**
PPU (formal workers)	3,278 (16.6%)	1,276 (10.5%)	4,554 (14.3%)	**< 0.001**
PBPU (informal workers)	4,344 (22.0%)	1,860 (15.3%)	6,204 (19.5%)	**< 0.001**
Non worker (including retiree)	269 (1.4%)	75 (0.6%)	344 (1.1%)	**< 0.001**
Jamkesda	531 (2.7%)	970 (8.0%)	1,501 (4.7%)	**< 0.001**

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Table 1 (continued)

	Urban (*n* = 19,722)	Rural (*n* = 12,142)	Total (*n* = 31,864)	*p*
Private insurance	334 (1.7%)	82 (0.7%)	416 (1.3%)	**< 0.001**
Self-managed insurance	259 (1.3%)	93 (0.8%)	352 (1.1%)	**< 0.001**
No insurance	5,464 (27.7%)	4,965 (40.9%)	10,429 (32.7%)	**< 0.001**

[a] The percentages do not add up to 100% because a person can attend more than one health service type in the last month

[b] Maternal and child health services includes outpatient care, inpatient care, and any services not captured by inpatient and outpatient services such as immunizations

[c] The education status of those < 15 years old is replaced with the education status of the head of the household

[d] Full-time employment and part-time employment were considered as being employed

[e] Only household heads were asked about the membership of insurance in the survey. The percentages do not add up to 100% because a person can own more than one type of health insurance

with a higher proportion of people in urban areas aged between 15 and 59 years (*p* = 0.013). Half (50.4%) of the study participants were female. A larger proportion of people in urban areas than in rural areas reported being 'very healthy'. About 43% of urban residents had completed at least secondary school, which was significantly higher than for rural residents (*p* < 0.001). A significantly higher proportion of urban residents lived in households where more than 20% of members were employed. People in urban households were also more likely to be in the highest wealth quintile (*p* < 0.001). The proportion of households where the head was not enrolled in any form of health insurance was significantly higher in rural areas (*p* < 0.001).

Health service utilization

The urban and rural populations visited different types of health facilities for outpatient and inpatient services. Around 14% of the survey subjects had attended outpatient services in the past month, and the difference between urban and rural areas was not significant (*p* = 0.197). The proportion of people visiting puskesmas, public hospitals, private hospitals/clinics, and private pharmacies for outpatient services was significantly higher in urban areas (*p* < 0.001). On the other hand, the proportion of people visiting private GPs/nurses/midwives was significantly higher in rural areas (*p* < 0.001). Less than 5% of the study population visited hospitals for inpatient care in the past 12 months. People in urban areas were more frequent visitors to public hospitals for inpatient care than those living in rural areas (*p* < 0.001). About 23% of the study population used maternal and child health services in the past 12 months, and the proportion was significantly higher in rural areas (*p* = 0.006).

Determinants of health service utilization

Factors associated with the significantly higher use of health services in primary care facilities included age,

being female (OR = 1.35, *p* < 0.001) and poorer self-rated health (Table 2). Individuals who completed secondary school were less likely to visit the primary care facilities (OR = 0.90, *p* = 0.033). When interactions between age and gender were modelled, females aged over 15 were found to have a higher odds of using primary care than males. There were no significant differences in primary care utilization among people with different insurance status. When the type of primary care facility (public or private) was considered (Appendix Table A1 and A2), people who received subsidised premiums under the JKN were more likely to obtain primary care from public health facilities and less likely from private health facilities compared to those who paid JKN premiums themselves.

Compared to children aged 5–14, children under five and people aged over 40 were more likely to visit public hospitals for outpatient services (Table 3). Females aged between 15 and 59 years were found to have a higher odds of using public hospital outpatient services than those of males. People living in rural areas were less likely to visit public hospitals for outpatient services (OR = 0.63, *p* = 0.026). Those with poorer self-rated health were also more likely to use outpatient services in public hospitals. Compared with people who paid JKN premiums themselves, people without insurance and people who received subsidised premiums under the JKN were less likely to visit public hospitals for outpatient services.

Determinants of inpatient service utilization in public hospitals are presented in Table 4. Factors associated with significantly higher use of inpatient care in public hospitals included being a child under five years of age (OR = 1.87, *p* < 0.001), being above the age of 60 (OR = 1.82, *p* < 0.001) and poorer self-rated health. Female aged 15–39 had a significantly higher likelihood of using public hospitals for inpatient services (OR = 2.86, *p* < 0.001). People without insurance and people who received subsidised premiums under the JKN were less

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Table 2 Determinants of health service utilization in primary care facilities in the past month

Variables	Odds ratio (95% CI)	*P*-value	Odds ratio (95% CI)	*P*-value
Age group	ref: 5–14		ref: male 5–14	
< 5	2.573 (2.246, 2.948)	< 0.001	2.420 (2.005, 2.921)	< 0.001
15–39	0.415 (0.371, 0.465)	< 0.001	0.293 (0.248, 0.347)	< 0.001
40–59	0.846 (0.757, 0.946)	0.003	0.610 (0.519, 0.716)	< 0.001
≥ 60	1.186 (1.030, 1.365)	0.018	0.898 (0.735, 1.096)	0.288
Gender	ref: male		ref: male 5–14 (vs. female 5–14)	
Female	1.349 (1.251, 1.455)	< 0.001	0.884 (0.749, 1.044)	0.146
Age_group#gender			ref: male 5–14	
< 5#Female			1.115 (0.850, 1.464)	0.432
15–39#Female			1.913 (1.522, 2.403)	< 0.001
40–59#Female			1.855 (1.489, 2.311)	< 0.001
≥ 60#Female			1.729 (1.329, 2.251)	< 0.001
Location	ref: urban			
rural	0.957 (0.824, 1.112)	0.566	0.960 (0.827, 1.116)	0.598
Completed secondary school	0.902 (0.820, 0.991)	0.033	0.914 (0.831, 1.005)	0.064
Insurance of household head	ref: JKN contributor			
No insurance	0.941 (0.828, 1.070)	0.353	0.944 (0.830, 1.073)	0.378
JKN subsidy[a]	0.961 (0.854, 1.082)	0.515	0.967 (0.859, 1.089)	0.580
Private health insurance[b]	1.103 (0.819, 1.486)	0.519	1.104 (0.819, 1.489)	0.516
Self-rated health	ref: very healthy			
Somewhat healthy	2.394 (2.177, 2.632)	< 0.001	2.390 (2.173, 2.628)	< 0.001
Somewhat unhealthy	7.125 (6.216, 8.167)	< 0.001	7.062 (6.160, 8.097)	< 0.001
Unhealthy	12.739 (8.984, 18.064)	< 0.001	12.687 (8.936, 18.013)	< 0.001
Proportion employed within household	ref: <20%			
20–50%	0.988 (0.893, 1.094)	0.821	0.987 (0.892, 1.093)	0.804
>50%	1.079 (0.942, 1.235)	0.273	1.078 (0.941, 1.235)	0.277
Wealth quantile	ref: 1 poorest			
2	1.127 (0.977, 1.301)	0.100	1.125 (0.975, 1.299)	0.106
3	1.051 (0.907, 1.219)	0.508	1.049 (0.904, 1.216)	0.529
4	1.168 (1.005, 1.358)	0.042	1.164 (1.001, 1.353)	0.048
5 richest	1.120 (0.950, 1.320)	0.178	1.118 (0.948, 1.318)	0.185
Constant	0.070 (0.056, 0.088)	< 0.001	0.086 (0.068, 0.109)	< 0.001
Variance at group level	Variance	VPC	Variance	VPC
Between-district	0.068	0.016	0.068	0.016
Within-district-between-household	0.914	0.214	0.921	0.215

JKN Jaminan Kesehatan Nasional, *VPC* variance partition coefficient

[a] Includes those covered by PBI and Jamkesda

[b] Includes those with private insurance and self-managed insurance

likely to use inpatient services in public hospitals than people who paid JKN premiums by themselves. People grouped in the richest quintile were also less likely to use public hospitals for inpatient services (OR = 0.73, *p* = 0.026).

Compared to children aged 5–14 years, study participants of other ages had a higher likelihood of being hospitalised in private hospitals (Table 5). Factors associated with a significantly higher likelihood of receiving inpatient care in private hospitals included being female (OR = 1.43, *p* < 0.001), a higher level of education (OR = 1.25, *p* = 0.027), and living in wealthier households. When interaction between age and gender was considered, females aged between 15 and 39 were more frequent users of private hospitals for inpatient services than (OR = 5.46, *p* < 0.001). Private health insurance holders were less likely to visit public hospitals but more likely to visit private hospitals for inpatient services compared with people who paid JKN premiums by themselves (OR = 1.54, *p* = 0.044).

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Table 3 Determinants of outpatient service utilization in hospitals in the past month

Variables	Odds ratio (95% CI)	*P*-value	Odds ratio (95% CI)	*P*-value
Age group	ref: 5–14		ref: male 5–14	
< 5	1.919 (1.092, 3.370)	0.023	1.818 (0.936, 3.534)	0.078
15–39	1.388 (0.893, 2.160)	0.145	0.666 (0.374, 1.188)	0.169
40–59	2.947 (1.930, 4.498)	< 0.001	1.700 (1.005, 2.877)	0.048
≥ 60	4.204 (2.672, 6.615)	< 0.001	3.037 (1.753, 5.262)	< 0.001
Gender	ref: male		ref: male 5–14 (vs. female 5–14)	
Female	1.053 (0.852, 1.301)	0.632	0.332 (0.138, 0.798)	0.014
Age_group#gender			ref: male 5–14	
< 5#Female			1.162 (0.326, 4.146)	0.817
15–39#Female			5.336 (1.984, 14.353)	0.001
40–59#Female			3.881 (1.510, 9.973)	0.005
≥ 60#Female			2.621 (0.994, 6.912)	0.052
Location	ref: urban			
rural	0.634 (0.425, 0.946)	0.026	0.636 (0.426, 0.949)	0.027
Completed secondary school	1.175 (0.915, 1.509)	0.206	1.185 (0.922, 1.524)	0.185
Insurance of household head	ref: JKN contributor			
No insurance	0.197 (0.125, 0.309)	< 0.001	0.197 (0.125, 0.311)	< 0.001
JKN subsidy[a]	0.688 (0.523, 0.905)	0.008	0.696 (0.528, 0.916)	0.010
Private health insurance[b]	0.638 (0.283, 1.440)	0.279	0.633 (0.279, 1.435)	0.274
Self-rated health	ref: very healthy			
Somewhat healthy	2.940 (2.236, 3.865)	< 0.001	2.925 (2.224, 3.847)	< 0.001
Somewhat unhealthy	13.154 (9.463, 18.285)	< 0.001	13.000 (9.340, 18.095)	< 0.001
Unhealthy	24.616 (13.534, 44.773)	< 0.001	24.287 (13.327, 44.261)	< 0.001
Proportion employed within household	ref: <20%			
20–50%	0.973 (0.746, 1.269)	0.842	0.973 (0.746, 1.270)	0.843
>50%	1.199 (0.877, 1.638)	0.256	1.199 (0.876, 1.640)	0.257
Wealth quantile	ref: 1 poorest			
2	0.953 (0.652, 1.393)	0.803	0.946 (0.647, 1.385)	0.777
3	1.415 (0.975, 2.053)	0.068	1.398 (0.962, 2.031)	0.079
4	1.337 (0.907, 1.971)	0.143	1.320 (0.894, 1.948)	0.163
5 richest	1.206 (0.791, 1.838)	0.384	1.198 (0.785, 1.829)	0.402
Constant	0.002 (0.001, 0.003)	< 0.001	0.003 (0.001, 0.005)	< 0.001
Variance at group level	Variance	VPC	Variance	VPC
Between-district	0.295	0.060	0.295	0.059
Within-district-between-household	1.374	0.277	1.400	0.281

JKN Jaminan Kesehatan Nasional, *VPC* variance partition coefficient

[a] Includes those covered by PBI and Jamkesda

[b] Includes those with private insurance and self-managed insurance

For maternal and child health services, children under five and females aged between 15 and 59 were more frequent users of these services (Table 6). Factors associated with a significantly lower likelihood of visiting these services were a higher education level (OR = 0.70, *p* < 0.001), receiving subsidised JKN premiums from the government (OR = 0.86, *p* = 0.003) and living in households where over half of the members were employed (OR = 0.64, *p* < 0.001). Rural residents and those living in the two wealthiest quintiles were more likely to use maternal and child health services. Other factors, such as self-rated health and private health insurance, did not have a significant influence on the utilization of maternal and child health services.

Differences in health service utilization between districts and households are presented in Tables 2, 3, 4, 5 and 6. The VPCs varied, with 2–8% of the variation in individual health service utilization attributable to the

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Table 4 Determinants of inpatient health service utilization in public hospital in the past 12 months

Variables	Odds ratio (95% CI)	*P*-value	Odds ratio (95% CI)	*P*-value
Age group	ref: 5–14		ref: male 5–14	
< 5	1.867 (1.381, 2.524)	< 0.001	2.056 (1.385, 3.053)	< 0.001
15–39	1.184 (0.937, 1.495)	0.157	0.649 (0.458, 0.920)	0.015
40–59	1.209 (0.949, 1.541)	0.124	1.124 (0.804, 1.571)	0.493
≥ 60	1.824 (1.393, 2.390)	< 0.001	2.142 (1.501, 3.055)	< 0.001
Gender	ref: male		ref: male 5–14 (vs. female 5–14)	
Female	1.080 (0.936, 1.245)	0.291	0.816 (0.551, 1.210)	0.313
Age_group#gender			ref: male 5–14	
< 5#Female			0.780 (0.422, 1.443)	0.429
15–39#Female			2.859 (1.769, 4.619)	< 0.001
40–59#Female			1.176 (0.727, 1.901)	0.509
≥ 60#Female			0.728 (0.435, 1.218)	0.226
Location	ref: urban			
rural	0.802 (0.624, 1.029)	0.083	0.799 (0.621, 1.028)	0.081
Completed secondary school	0.919 (0.776, 1.088)	0.328	0.906 (0.764, 1.074)	0.253
Insurance of household head	ref: JKN contributor			
No insurance	0.322 (0.248, 0.418)	< 0.001	0.319 (0.246, 0.415)	< 0.001
JKN subsidy[a]	0.811 (0.673, 0.977)	0.027	0.811 (0.672, 0.978)	0.029
Private health insurance[b]	0.422 (0.211, 0.847)	0.015	0.422 (0.210, 0.850)	0.016
Self-rated health	ref: very healthy			
Somewhat healthy	2.200 (1.860, 2.603)	< 0.001	2.207 (1.864, 2.613)	< 0.001
Somewhat unhealthy	5.544 (4.432, 6.934)	< 0.001	5.601 (4.471, 7.017)	< 0.001
Unhealthy	14.210 (9.244, 21.842)	< 0.001	14.206 (9.207, 21.921)	< 0.001
Proportion employed within household	ref: <20%			
20–50%	1.123 (0.947, 1.333)	0.182	1.126 (0.948, 1.337)	0.176
>50%	1.211 (0.971, 1.511)	0.090	1.222 (0.978, 1.527)	0.078
Wealth quantile	ref: 1 poorest			
2	0.884 (0.703, 1.111)	0.289	0.877 (0.697, 1.105)	0.266
3	0.974 (0.770, 1.232)	0.826	0.958 (0.756, 1.214)	0.724
4	0.895 (0.700, 1.146)	0.379	0.877 (0.684, 1.125)	0.302
5 richest	0.728 (0.550, 0.964)	0.026	0.716 (0.540, 0.950)	0.021
Constant	0.015 (0.009, 0.022)	< 0.001	0.017 (0.010, 0.026)	< 0.001
Variance at group level	Variance	VPC	Variance	VPC
Between-district	0.258	0.064	0.264	0.065
Within-district-between-household	0.466	0.116	0.508	0.125

JKN Jaminan Kesehatan Nasional, *VPC* variance partition coefficient

[a] Includes those covered by PBI and Jamkesda

[b] Includes those with private insurance and self-managed insurance

district level. In our data, living in a rural area was found to increase the likelihood of using maternal and child health services. A small VPC between districts suggests a low likelihood of finding a person in an urban area who presents higher odds of using maternal and child health services than a person in a rural area. Around 11–28% of the variation in health service utilization was attributable to the household level. In this study, household wealth was also found to impact the utilization of maternal and child health services, and a VPC of 12% indicated that the chances are small of finding a person from a poorer household who had higher odds of using maternal and child health services than a person from a richer household. The remaining 66–81% of the variation in health service utilization was attributable to the individual level, suggesting that it was the individual characteristics that had a greater impact on health service utilization.

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Table 5 Determinants of inpatient health service utilization in private hospital in the past 12 months

Variables	Odds ratio (95% CI)	*P*-value	Odds ratio (95% CI)	*P*-value
Age group	ref: 5–14		ref: male 5–14	
< 5	2.925 (2.041, 4.192)	< 0.001	2.988 (1.877, 4.757)	< 0.001
15–39	1.754 (1.300, 2.366)	< 0.001	0.640 (0.409, 1.003)	0.052
40–59	1.814 (1.325, 2.485)	< 0.001	1.386 (0.907, 2.117)	0.131
≥ 60	2.283 (1.583, 3.293)	< 0.001	1.975 (1.220, 3.199)	0.006
Gender	ref: male		ref: male 5–14 (vs. female 5–14)	
Female	1.426 (1.200, 1.695)	< 0.001	0.655 (0.382, 1.125)	0.125
Age_group#gender			ref: male 5–14	
< 5#Female			0.931 (0.445, 1.947)	0.849
15–39#Female			5.457 (2.897, 10.279)	< 0.001
40–59#Female			1.791 (0.951, 3.371)	0.071
≥ 60#Female			1.397 (0.688, 2.834)	0.355
Location	ref: urban			
rural	1.253 (0.936, 1.679)	0.130	1.256 (0.936, 1.686)	0.129
Completed secondary school	1.248 (1.025, 1.520)	0.027	1.235 (1.013, 1.506)	0.037
Insurance of household head	ref: JKN contributor			
No insurance	0.433 (0.330, 0.567)	< 0.001	0.430 (0.327, 0.564)	< 0.001
JKN subsidy[a]	0.581 (0.461, 0.732)	< 0.001	0.580 (0.459, 0.732)	< 0.001
Private health insurance[b]	1.542 (1.013, 2.348)	0.044	1.555 (1.017, 2.379)	0.042
Self-rated health	ref: very healthy			
Somewhat healthy	1.536 (1.252, 1.884)	< 0.001	1.538 (1.252, 1.889)	< 0.001
Somewhat unhealthy	3.974 (3.048, 5.180)	< 0.001	4.032 (3.088, 5.264)	< 0.001
Unhealthy	6.584 (3.593, 12.067)	< 0.001	6.405 (3.480, 11.786)	< 0.001
Proportion employed within household	ref: <20%			
20–50%	0.928 (0.752, 1.146)	0.490	0.931 (0.753, 1.152)	0.511
>50%	1.202 (0.928, 1.556)	0.163	1.221 (0.941, 1.585)	0.132
Wealth quantile	ref: 1 poorest			
2	1.174 (0.834, 1.653)	0.357	1.171 (0.830, 1.652)	0.368
3	1.507 (1.078, 2.105)	0.016	1.492 (1.066, 2.089)	0.020
4	1.606 (1.148, 2.246)	0.006	1.577 (1.125, 2.210)	0.008
5 richest	2.002 (1.415, 2.833)	< 0.001	1.983 (1.398, 2.812)	< 0.001
Constant	0.003 (0.002, 0.006)	< 0.001	0.005 (0.003, 0.008)	< 0.001
Variance at group level	Variance	VPC	Variance	VPC
Between-district	0.165	0.038	0.166	0.038
Within-district-between-household	0.858	0.199	0.911	0.209

JKN Jaminan Kesehatan Nasional, *VPC* variance partition coefficient

[a] Includes those covered by PBI and Jamkesda

[b] Includes those with private insurance and self-managed insurance

Discussion

Analysing a recent national household survey, this study found that age, gender and self-rated health needs are key drivers of utilization of outpatient and inpatient health services in Indonesia. According to the Andersen model, equitable access to healthcare occurs when predisposing factors and health needs are the main determinants of healthcare utilization, which suggests that outpatient and inpatient health service utilization in Indonesia is largely equitable on this criterion. However, we still observed differences in levels of healthcare utilization across education levels, wealth quintiles and health insurance status, indicating inequitable access to certain types of health facilities. For maternal and child health services, several enabling factors including area of residence and household wealth were found to be associated with utilization in addition to age and gender factors, which also indicated certain disparity in accessing these services.

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Table 6 Determinants of maternal and child health service utilization in the past 12 months

Variables	Odds ratio (95% CI)	*P*-value	Odds ratio (95% CI)	*P*-value
Age group	ref: 5–14		ref: male 5–14	
< 5	1.785 (1.595, 1.998)	< 0.001	1.664 (1.427, 1.942)	< 0.001
15–39	0.219 (0.202, 0.238)	< 0.001	0.040 (0.034, 0.047)	< 0.001
40–59	0.092 (0.083, 0.102)	< 0.001	0.012 (0.009, 0.016)	< 0.001
≥ 60	0.007 (0.005, 0.010)	< 0.001	0.005 (0.003, 0.010)	< 0.001
Gender	ref: male		ref: male 5–14 (vs. female 5–14)	
Female	3.624 (3.372, 3.894)	< 0.001	1.016 (0.904, 1.142)	0.789
Age_group#gender			ref: male 5–14	
< 5#Female			1.023 (0.819, 1.278)	0.842
15–39#Female			14.399 (11.920, 17.393)	< 0.001
40–59#Female			18.415 (13.489, 25.140)	< 0.001
≥ 60#Female			2.186 (0.994, 4.810)	0.052
Location	ref: urban			
rural	1.160 (1.013, 1.330)	0.032	1.172 (1.019, 1.347)	0.026
Completed secondary school	0.702 (0.649, 0.759)	< 0.001	0.713 (0.657, 0.774)	< 0.001
Insurance of household head	ref: JKN contributor			
No insurance	0.901 (0.810, 1.002)	0.054	0.903 (0.809, 1.007)	0.068
JKN subsidy[a]	0.859 (0.778, 0.949)	0.003	0.872 (0.787, 0.966)	0.009
Private health insurance[b]	0.945 (0.739, 1.207)	0.649	0.956 (0.743, 1.232)	0.730
Self-rated health	ref: very healthy			
Somewhat healthy	0.977 (0.899, 1.061)	0.579	0.968 (0.889, 1.053)	0.447
Somewhat unhealthy	1.053 (0.900, 1.231)	0.520	0.997 (0.850, 1.169)	0.972
Unhealthy	0.907 (0.539, 1.528)	0.714	0.802 (0.466, 1.379)	0.425
Proportion employed within household	ref: <20%			
20–50%	0.963 (0.887, 1.045)	0.364	0.960 (0.881, 1.045)	0.341
>50%	0.635 (0.562, 0.717)	< 0.001	0.621 (0.547, 0.704)	< 0.001
Wealth quantile	ref: 1 poorest			
2	0.982 (0.869, 1.110)	0.775	0.974 (0.859, 1.105)	0.681
3	1.027 (0.907, 1.162)	0.676	1.013 (0.892, 1.151)	0.840
4	1.140 (1.006, 1.292)	0.040	1.121 (0.986, 1.276)	0.082
5 richest	1.312 (1.145, 1.504)	< 0.001	1.321 (1.147, 1.521)	< 0.001
Constant	0.493 (0.366, 0.664)	< 0.001	0.933 (0.688, 1.265)	0.654
Variance at group level	Variance	VPC	Variance	VPC
Between-district	0.335	0.082	0.342	0.082
Within-district-between-household	0.471	0.115	0.533	0.128

JKN Jaminan Kesehatan Nasional, *VPC* variance partition coefficient

[a] Includes those covered by PBI and Jamkesda

[b] Includes those with private insurance and self-managed insurance

Gender was found to be a key predisposing factor that impacted the use of healthcare in this study, which is consistent with studies from Indonesia [13] and other low- and middle-income countries (LMICs) [38, 39]. Our findings that women are more frequent users of health services may reflect their higher health need in areas such as reproductive health. Although the life expectancy of women in Indonesia is slightly better than that of men [40], the prevalence of overweight and obesity is higher among women while the prevalence of physical activity among women and girls is lower which increases the risk of non-communicable diseases [41]. Further research is warranted to understand the gender differences in health needs and healthcare-seeking behaviour in Indonesia, which could inform the design of tailored health programs to improve health for all. Age was found to be another important predisposing factor in this study. Being under five years of age was associated with significantly higher odds of using primary and secondary outpatient and child health services compared to other age

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groups. This finding is consistent with those from other LMICs [38, 42, 43]. A possible explanation for this is that children under five are more vulnerable to diseases. Although the under-five mortality rate has continued to fall in Indonesia, it is still higher than in countries with comparable economic development status [44]. In Indonesia, the prevalence of stunting among children under five years of age was over 30%, and only 58% of children aged 12–23 months were fully immunized in 2018 [45]. Indonesia has taken several steps to improve child health, including vaccination campaigns and interventions targeting stunting [46, 47]. The higher likelihood of children under five using child health services (e.g. vaccination) in this study may also reflect the widespread implementation of these preventive measures.

In terms of enabling factors, not surprisingly, individuals from wealthier households in this study were more likely to use private hospitals for inpatient care, as were those who had completed secondary school. Although it is not clear what type of insurance was used to fund visits to private hospitals by people from wealthier households and those with higher levels of education, it is conceivable that these groups may have been more able to pay for services often perceived to be of a higher quality in the private sector [48]. Since more than 50% of Indonesia's hospitals are private [49], it is important to monitor the quality of care in both public and private hospitals to ensure equal access to quality healthcare regardless of affordability. Rural residence has been found to be associated with reduced odds of seeking care in previous studies [38, 43, 50]. Our study also found that people living in rural areas were less likely to use outpatient health services in public hospitals, which could be partly explained by the uneven distribution of secondary healthcare facilities in Indonesia [25, 27]. However, people living in rural areas were found to be more likely to use maternal and child health services in our study. This is probably because the total fertility rate is higher among women in rural areas than in urban areas in Indonesia (2.3 for urban areas and 2.6 for rural areas) [51].

In this study, we also found that the health insurance status of impacted on healthcare seeking behaviour. Our study found that people without health insurance were less likely to seek care in hospitals, most likely because of perceived cost constraints. As expected, we found that private insurance holders were more likely to use private hospitals compared to people insured under the JKN. Since the JKN is designed to provide financial protection and increase access to healthcare services, it is encouraging to find that those who paid their own JKN premiums were more likely to visit hospitals for both outpatient and inpatient care than those without insurance. However, those receiving subsidised premiums under

the JKN were less likely to obtain healthcare from private primary care providers and secondary health facilities (public or private) compared with those who paid their own JKN premiums. As only the poor and disadvantaged populations receive JKN subsidies, other non-price barriers such as being less informed about the benefits of health insurance [52–55] and the long distance to health facilities [56–58] may prevent them from using the same level of healthcare as the more affluent contributing JKN members.

Strengths and limitations

A key strength of this study is the use of a more recent national household survey. Earlier studies have depended on IFLS data from 2014, which was collected before the JKN became fully operational. Our study analysed data collected in the first quarter of 2018, when the JKN covered approximately 195 million individuals (73% of the total population) in Indonesia [59]. The more recent data used in this study enabled us to gain updated insights into the factors associated with healthcare utilization in the JKN era. One limitation was the use of self-rated health as a proxy for 'health need' in this study. The subjective measure may not reflect the true health state, as individuals hold different perceptions of health status [60]. Another limitation is that this study did not assess the impact of quality of care (perceived or objective) on healthcare utilization due to a lack of data. Future studies may consider incorporating variables for healthcare quality. It should also be noted that 'equitable access' in this study was defined according to Andersen's Behavioural Model, which is not without limitations. For example, in Andersen's model, healthcare utilization differences driven by financial enabling factors would be considered 'inequitable'. However, in the real world, a situation where the poor and the rich have equal rates of utilization, but the poor use public facilities and the rich use private facilities, may not necessarily be regarded as inequitable. In a complex healthcare system such as Indonesia's, where over half of all hospitals are run by private organizations, other empirical approaches such as measuring horizontal inequity [61–63] may be warranted to assess equity in healthcare utilization in Indonesia. Finally, due to the limited number of variables that could be collected in the ENHANCE survey, this study did not examine some factors previously shown to be associated with health service utilization, such as type of disease and lifestyle [64].

Implications for future studies and policies

People receiving subsidized premiums under the JKN account for over 40% of total JKN members [65], but their likelihood of using hospital outpatient and inpatient services was significantly lower than that of those who

paid JKN premiums by themselves. Further studies are needed to establish whether there is unmet health need among low-income JKN members and what factors are hindering them from seeking healthcare at secondary hospital facilities. Moreover, those receiving JKN subsidies were found to be less likely to access private primary care providers. Although it is not required by regulation, the majority of PBI members (receiving JKN subsidies) are automatically assigned to Puskesmas for primary care services. We suggest that policy makers in Indonesia relax this rule and allow low-income JKN members to choose their preferred primary care providers, whether public or private. Their involvement in choosing their own preferred provider is likely to enhance service uptake. This may also stimulate competition between public and private providers and attract more private health providers to join the JKN network. Since the uninsured are also less likely to use hospital services and more households in rural areas are uninsured compared to urban ones, more aggressive measures are required to enrol rural residents into the JKN program as Indonesia progresses towards UHC.

Conclusions

Using Andersen's model, this study has demonstrated that the distribution of healthcare utilization in Indonesia was largely equitable as predisposing factors and health need were found to greatly influence the utilization of different types of health services. This study also highlighted some inequity present in the health system, with enabling factors such as health insurance status shown to be associated with healthcare utilization. This study has provided important evidence to inform the design of policies to achieve a more equitable pattern of health service use in Indonesia.

Abbreviations
GDP	gross domestic product
GP	general practitioner
IDR	Indonesian Rupiah
IFLS	Indonesian Family Life Survey
INA-CBG	Indonesian Case Base Groups
JKN	Jaminan Kesehatan Nasional
LMIC	low- and middle-income country
UHC	universal health coverage
UN	United Nations
VPC	Variance partition coefficient
WHO	World Health Organization

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12913-024-11951-8.

Supplementary Material 1.

Supplementary Material 2.

Data availability
Post-processing source data are presented within this study. Proposal to access the ENHANCE survey datasets should be directed to the corresponding author to gain access. Data requestors will need to sign a data access agreement.

Declarations

Ethics approval and consent to participate
Informed written consent was obtained from the heads of households who completed the survey. No illiterate participants were involved in this study. Study protocols were approved by the University of Indonesia Ethics Committee (Reference: 503/H2.F10/PPM.00.02/2017); London School of Hygiene & Tropical Medicine Ethics Committee (Reference: 13773); and the University of New South Wales Ethics Committee (Reference: HC17709). All methods were carried out in accordance with relevant guidelines and regulations.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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