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Review Article

Determinant of Life Expectancy in Indonesia: Bibliometrics Literature Review

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Abstract

Most of the provinces (74 percent) in Indonesia have life expectancy below the national average. There is a gap in life expectancy between provinces in Indonesia. Justice and equitable development are urgently needed in Indonesia. Increasing life expectancy will contribute to increasing household income thereby reducing poverty levels. A bibliometric literature review was conducted to explain the determinants of life expectancy in Indonesia. A literature search was carried out in the Google Scholar database using the keyword life expectancy in Indonesia. The criteria for selecting literature are those starting in 2015 and published in journals indexed by Scopus, Sinta, and Copernicus. The article searches successfully controlled 19,900 articles. Article selection succeeded in controlling 25 articles that met the criteria. The determinants of life expectancy in Indonesia can be divided into health, social, economic, demographic, political, and environmental infrastructure factors. Recent research on the determinants of life expectancy in Indonesia focuses on health infrastructure variables. Future research needs to be carried out to provide evidence of the influence of inadequate food consumption, food insecurity, stunting, availability of medicines in health facilities, unmet health service needs, self-medication, hand washing facilities, and crime on life expectancy in Indonesia.

Keywords: *Life Expectancy; Longevity; Poverty; Quality of Life*

Introduction

The basic indicator for assessing development results in the health sector is life expectancy. Life expectancy at birth is the number of years a newborn child will live if faced with the risk of death that applies to the population at the time the child is born (Todaro & Smith, 2020). Low-income countries have low life expectancy (United Nations, 2024). The premature death of the head of the household shifts the balance of household income into a circle of poverty (Lawanson & Umar, 2021; Kunciotutu, *et al*., 2018). Increasing life span encourages better levels of education which ultimately helps poor people escape the cycle of poverty (Bleakley, 2018). People living longer has a positive impact on the economy that outweighs the negative impact on the economy due to an aging population (Scott, 2021; Siegel, Schug & Rieger, 2022)

Based on Macrotrends data (2024), Indonesia's life expectancy is below the average for countries in Southeast Asia, Asia, and the world. Based on data from the Central Statistics Agency (BPS, 2024), life expectancy in Indonesia in 2023 is 72.13 years. Most or 74 percent of the total provinces have a life expectancy that is less than the national average. The three provinces with the lowest life expectancy in Indonesia are West Sulawesi province 66.01 years, Papua 66.44 years, and Maluku 66.78 years.

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This data explains the injustice of development which has an impact on the gap in life expectancy between provinces in Indonesia.

Better understanding the determinants of people's life expectancy over time is critical to tracking progress on the sustainable development goals (SDGs) by ensuring healthy lives and improving well-being for all people of all ages (WHO, 2024). Literature studies that focus on explaining the determinants of life expectancy in Indonesia are limited.

Methodology

Type of Research

This research was conducted using a literature review and bibliometric approach. Literature reviews are carried out by collecting, reviewing, and explaining the results of previous research (Purssell & McCrae, 2020). Bibliometric reviews are carried out to assess existing empirical literature to determine possible research gaps, and highlight knowledge limitations, and developments regarding a particular research focus (Ball, 2017). The bibliometrics study in this research focuses on explaining the development of empirical literature.

Place and Time of Research

The criteria for selecting literature are articles published starting in 2015. Articles that cannot be fully accessed are still included in the criteria if the abstract of the article contains the required information.

Population and Sample

A literature search was carried out on the Google Scholar database using the keyword life expectancy in Indonesia.

Data Collection

Literature screening is carried out quickly to assess articles according to established criteria. Next, group articles published in journals based on the composition indexed by Scopus, Sinta, and Copernicus.

Data Analysis and Processing

Bibliometric studies were carried out with the help of the VOSviewer application.

Results

A literature search based on the keyword life expectancy in Indonesia displayed 19,900 articles from 2015. A total of 25 selected articles focused on explaining the factors determining life expectancy in Indonesia (Table 1).

Table 1: Literature Review

No	Author, Years	Data, Method, Variable	Results
1	Kristanto *et al.*, 2019	Utilising BPS data for 2010-2016 in Indonesia. Using panel data regression to estimate the effect of the following variables. a. Health infrastructure: (1) health workers, (2) health facilities, and (3) health insurance b. Socioeconomic: (1) dependency ratio, (2) Gini index, and (3) poverty level	Health workers and health insurance have a positive effect, dependency ratio, and poverty have a negative effect, health facilities, and the Gini index have no significant effect on life expectancy.
2	Seran, 2019	Utilising BPS data from 1976-2018 in Indonesia. Using Path Analysis to estimate the effect of economic	Economic growth and education level have a positive effect, poverty level, inflation, Gini ratio,

		growth, inflation, Gini ratio, dependency ratio, education level, and poverty.	and dependency ratio have a negative effect on life expectancy.
3	Widiastuty, 2019.	Utilising BPS data for 2013-2017 in West Java. Using panel data regression to estimate the effect of the gender empowerment variable based on the variables of women's average years of schooling, women's per capita expenditure, women working as professionals, managers, administration, and technical staff.	All gender empowerment variables have a positive effect on life expectancy.
4	Sudharsanan & Ho, 2020	Utilise Indonesian family life survey (IFLS) data for 2000, 2007, 2014/2015. Using Poisson Regression to estimate the impact of blood pressure, body mass index, and smoking.	The difference in life expectancy of residents in rural and urban areas is caused by blood pressure and body mass index, and smoking has no impact.
5	Gabrela *et al.*, 2020.	Utilising 2017 BPS data in Papua. Using Nonparametric Truncated Splines to estimate poverty, morbidity, smoking, immunisation coverage, and doctor ratio variables.	Poverty levels, morbidity and smoking have a negative effect, immunisation coverage, and the ratio of doctors have a positive effect on life expectancy.
6	Budiantara, 2020.	Utilising 2013 BPS data in East Java. Using Semiparametric Regression to estimate the variables of infant mortality rate, breastfed babies, labor force participation rate, literacy rate, and average years of schooling.	Infant mortality rates have a negative effect, babies who receive breast milk, labour force participation rates, literacy rates, and average years of schooling have a positive effect on life expectancy.
7	Paramita, Yamazaki, & Koyama, 2020.	Utilising 2015 BPS data in Indonesia. Using Structural Equation Modeling (SEM) to estimate the effect of the following variables. a. Health system: (1) insurance ownership, (2) number of general practitioners per population, (3) number of specialist doctors per population, (4) number of nurses per population, (5) number of midwives per population, (6) number of health centers per population, (7) number of hospitals per population, and (8) number of hospital beds per population. b. Socioeconomic: (1) expected years of schooling, (2) average years of schooling, (3) Gini index, (4) poverty, and (5) per capita expenditure. c. Demographics: (1) maternal mortality rate, and (2) infant mortality rate.	There are six constructs that have a large correlation with life expectancy. These constructs are health workers, health facilities, environment, average years of schooling, and per capita expenditure.

		Environment: (1) percentage of households that have adequate clean water and (2) percentage of households that have adequate sanitation.	
8	Padatuan, Sifriyani, & Prangga, 2021.	Utilising 2020 BPS data on the island of Kalimantan. Using the nonparametric spline truncated birespon regression method to estimate the variables of breastfed babies aged 0-6 months, families living healthy and clean, economic growth rates, mothers giving birth assisted by health workers, and poverty levels.	Babies are fed breast milk aged 0-6 months, families behave in a healthy and clean way, the rate of economic growth, mothers giving birth assisted by health workers have a positive effect, poverty levels, and infant mortality rates have a negative effect on life expectancy.
9	Al Azies & Dewi, 2021	Utilising 2015 BPS data in Central Java. Using Linear Regression Models and Bayesian Model Averaging (BMA) to estimate the variables of infant mortality, illiteracy rate, access to adequate drinking water, population with health complaints, and mothers giving birth assisted by health workers.	The illiteracy rate has a negative effect, access to adequate drinking water, residents with health complaints, and mothers giving birth assisted by health workers do not have a significant effect on life expectancy.
10	Haekal & Sihaloho, 2021	Utilising secondary data from 2010-2017 in Indonesia. Using panel data regression to estimate the expected length of schooling variables for women, the percentage of women's income contribution, and the percentage of women in the professional profession	The expected length of schooling for women, the percentage of women's income contribution, and the percentage of women in professional education have a positive effect on the life expectancy of women in Indonesia.
11	Demung *et al*., 2022.	Utilising BPS 2008-2019 in West Nusa Tenggara. Using panel data regression analysis to estimate basic immunisation variables, the level of mothers giving birth assisted by health workers, and access to adequate sanitation.	Immunisation levels, giving birth in a health facility, mothers giving birth assisted by health workers, and access to adequate sanitation have a positive effect on life expectancy.
12	Bashir *et al*., 2022.	Utilising BPS data from 1985-2019 in Indonesia. Using Autoregressive Distributed Lag (ADL) to estimate the effect of air pollution variables and economic growth.	Air pollution has a negative effect and economic growth has a positive effect on life expectancy.
13	Daindes *et al*., 2022.	Utilising BPS data for 2015-2019 in Indonesia. Using the panel data regression method to estimate the following variables: a. Access to health services: (1) Bed ratio in health facilities & (2) Doctor ratio	The ratio of beds in health facilities, the ratio of doctors, the average number of years of schooling, and the literacy rate have a positive influence, the Gini ratio and the poverty severity index have a negative influence on life expectancy.

		b. Educational status: (1) Average years of schooling & (2) Literacy rate Social Status: (1) Gini Ratio & (2) Poverty severity index	
14	Hendrawaty *et al*., 2022.	Utilising BPS data for 1988-2018 in Indonesia. Using the Dynamic Panel method to estimate the influence of the GDP per capita variables, electricity consumption, and economic growth.	GDP per capita, electricity consumption, and economic growth have a positive effect on life expectancy.
15	Septianingsih, 2022.	Using BPS data for 2017-2021 in Indonesia. Using the panel data regression method to estimate the influence of the variables access to adequate drinking water, and access to adequate housing, access to adequate sanitation, poverty level, and average years of schooling.	Access to adequate sanitation and average years of schooling have a positive influence, poverty levels have a negative influence, access to adequate drinking water and access to adequate housing has no significant influence on life expectancy.
16	Setiawan *et al*., 2023.	Utilising BPS data for 2000-2020 in Indonesia. Using two-stage least squares (2SLS) to estimate the effect of economic growth, carbon emissions, poverty rates, death rates, and health expenditure.	Health expenditure and economic growth have a positive effect, death rates have a negative effect, carbon emissions, and poverty levels do not have a significant effect on life expectancy.
17	Arum *et al*., 2023.	Utilising BPS data for 2021 in Central Java. Using a spatial regression model estimates the effect of unemployment and poverty levels.	Unemployment and poverty levels have a negative effect on life expectancy.
18	Setyadi *et al*., 2023.	Utilising BPS data for 2010-2018 in Indonesia. Using panel data regression to estimate the following variables. a. Health infrastructure: (1) number of beds in hospitals, (2) health workers in health centers and hospitals, and (3) insurance b. Politics: (1) human rights & (2) Indonesian democracy index c. Socioeconomic: (1) Gini index (2) poverty, (3) dependency ratio, (4) GRDP per capita, (5) access to clean water and potable water, (6) access to toilets, (7) access to adequate sanitation eligible, (8) illiterate rate, (9) exclusive breastfeeding, and (10) neonatal	GRDP per capita, immunisation, average years of schooling, and insurance have a positive influence, human rights, democracy, poverty, Gini index, dependency ratio, illiteracy, and breastfeeding have a negative influence, beds in health facilities, resources, water, toilets, sanitation, and newborns do not have a significant effect on life expectancy.
19	Setyadi *et al*., 2023.	Utilising BPS 2010-2020 in Indonesia. Using the Generalised Method of Moment (GGM) to estimate the following variables.	Health infrastructure and environmental conditions such as sanitation and access to adequate drinking water are very

		a. Socioeconomic variables: (1) gross regional domestic product per capita, (2) percentage of poor population, (3) Gini index, (4) open unemployment rate, and (5) literacy rate. Health variables: (1) number of doctors in community health centers, (2) number of specialist doctors, (3), number of nurses, (4), number of new HIV cases, (5) number of new AIDS cases, (6) sanitation, (7) number of hospital beds, (8) ratio of community health centers, (9) health insurance coverage, (10) percentage of population who have health complaints, (11) population who seek outpatient treatment, (12) percentage of households with access to adequate drinking water, (13) percentage of mothers giving birth assisted by health workers, (14) percentage of households that have their toilet facilities, (15) percentage of babies who are exclusively breastfed, and (16) percentage of active family planning	important to support and guarantee access to the health services that the community needs. Social and economic status, such as GRDP per capita, literacy, unemployment, and poverty also contribute to increasing life expectancy
20	Kholillullah *et al*., 2023	Utilising BPS data for 2000-2009 in Indonesia. Using the Autoregressive Distributed Lag (ADL) method to estimate the effect of GDP per capita variables, and government spending in the health and education sectors.	Government spending in the health and education sectors has a positive effect, GDP per capita does not have a significant effect on life expectancy.
21	Anisar *et al*., 2023	Utilising BPS data for 2021 in Indonesia. Using Nonparametric Regression to estimate the effect of underweight toddlers, poverty level, breastfed toddlers, and households with national health insurance coverage.	Underweight toddlers, poverty levels have a positive effect, toddlers who receive breast milk, and households with national health insurance coverage have a positive effect on life expectancy
22	Hasnawati *et al*., 2024	Utilising BPS data from 1950-2020 in Indonesia. Using Granger-Causality, impulse response function (IRF), and forecasting and error covariance decomposition proportions to estimate the relationship between the variables life expectancy, carbon dioxide (CO2) emissions, population growth (PG), and gross domestic product (GDP) growth.	The research results show that there is a two-way relationship between the life expectancy variable and population growth. Partially, economic growth is proxied by GDPG which influences life expectancy, and CO2 which influences PG. However, CO2 has no effect on life expectancy and GDPG in Indonesia.
23	Suharsih *et al*., 2024	Utilising BPS data for 2000-2022 in Yogyakarta. Using multiple linear	The number of health workers, outpatient visits, and inpatient

		regression to estimate the influence of the variables number of health workers, outpatient visits, inpatient visits, number of hospitals, and number of health centers.	visits do not have a significant effect, while the number of hospitals and health centers has a significant effect on life expectancy.
24	Dalimunthe *et al.*, 2024.	Using BPS data for 2021-2023 at the district/city level in Indonesia. Using a random forest model to estimate the effect of smoking prevalence on life expectancy.	The prevalence of smoking has a negative impact on life expectancy in Indonesia.
25	Wirayuda *et al.*, 2024.	Using partial least squares structural equation models with World Bank data from 1980 to 2020 in Oman and Indonesia. This study examines the influence of health resource (HSR), macroeconomic (ME), and sociodemographic (SD) factors on life expectancy.	A strong construct between life expectancy and macroeconomic, sociodemographic, and health resource factors in Indonesia.

There are 8 articles published in Scopus-indexed journals, 16 articles published in Sinta Indexed Journals, and 1 Copernicus-indexed article. Various methods were used in previous research. The data used are 24 articles sourced from the Indonesian Central Statistics Agency and 1 article sourced from the Indonesian Family Life Survey (IFLS). The variables that determine life expectancy in Indonesia can be divided into health infrastructure, socioeconomic, demographic, political, and environmental factors (Figure 1).

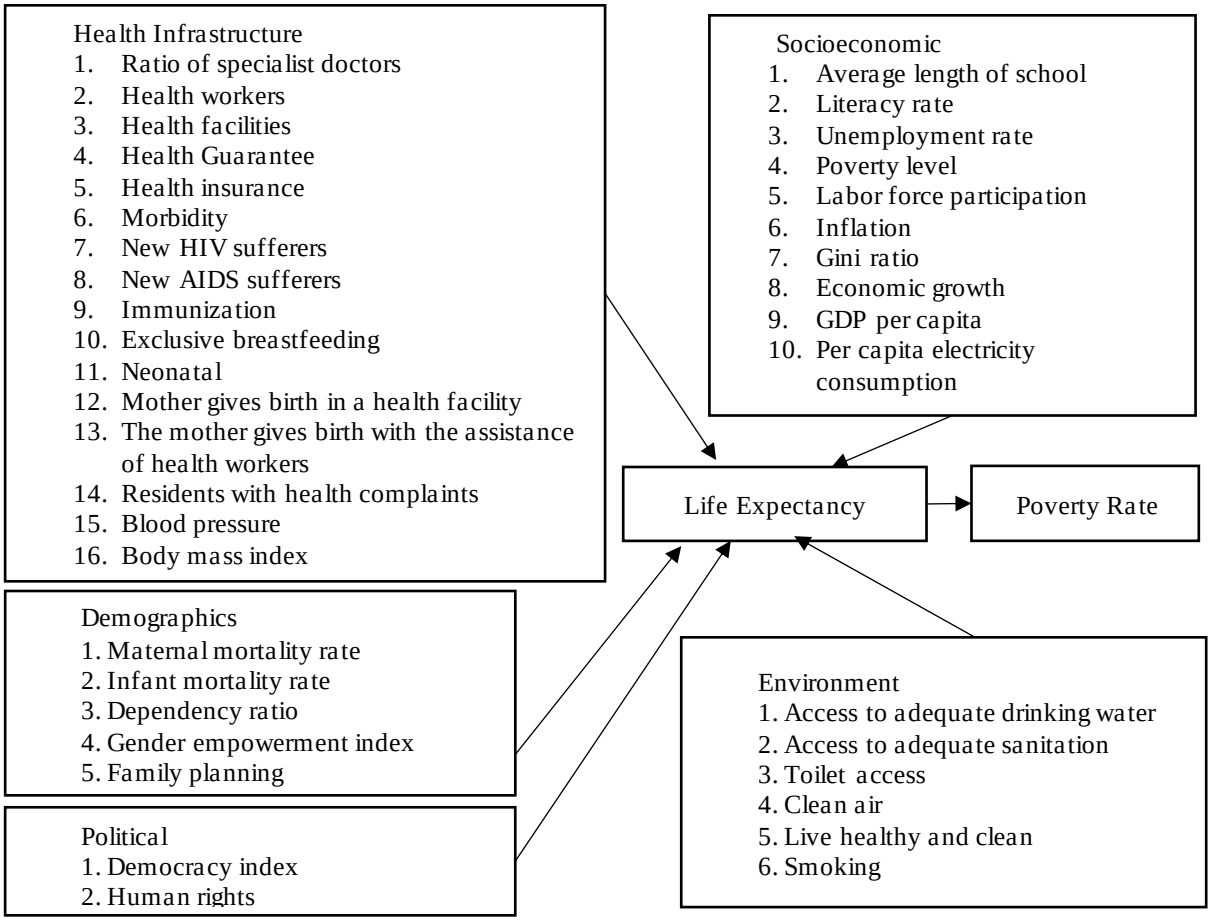

Figure 1: Determinants of Life Expectancy in Indonesia

The development of research focus regarding the determinants of life expectancy in Indonesia is as follows (Figure 2).

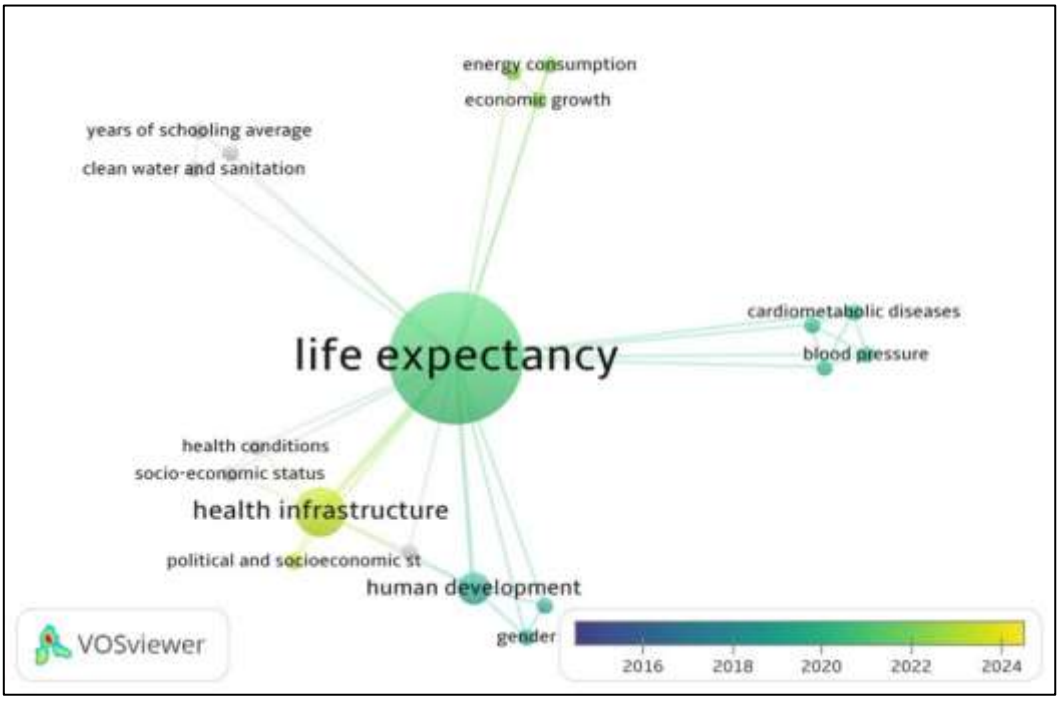

Figure 2: Bibliometrics Review

Previous research focused on explaining the influence of human resource development, education, economic growth, socio-economics, health infrastructure, health conditions, politics, clean water, sanitation, energy use, accessibility, community, blood pressure, cardiometabolic disease, and gender in Indonesia. The latest research in yellow focuses on explaining the influence of health infrastructure on life expectancy in Indonesia. Health infrastructure is the main focus of research on life expectancy in Indonesia.

Discussion

The findings from the literature review highlight the complexity of factors influencing life expectancy in Indonesia. While previous studies have primarily focused on health infrastructure, socioeconomic status, and environmental conditions, there remains a need to explore additional determinants. Research from other countries suggests that variables such as malnutrition (Djoumessi, 2022), food insecurity (Uchendu *et al*., 2018), stunting (Wright *et al*., 2021), and access to essential medicines (Obiedalla, Patel & Donyai, 2023) play a significant role in shaping life expectancy. However, these factors have not been extensively studied in the Indonesian context.

A significant gap in the current body of knowledge is the role of healthcare accessibility beyond infrastructure. While indicators such as the number of hospitals, doctors, and health workers have been analyzed, the impact of unmet healthcare needs (Li *et al*., 2020) and self-medication practices (Mohammed *et al*., 2021) remains unclear. In many regions, limited access to healthcare services leads to a reliance on self-medication and traditional remedies, which may not always be effective or safe.

Furthermore, the environmental determinants of life expectancy require further exploration. Prior studies have emphasized the importance of sanitation, clean drinking water, and air quality, yet other crucial factors such as crime rates (Aburto *et al*., 2021) and exposure to environmental pollutants like heavy metals have not been thoroughly investigated. High crime rates can lead to increased mortality due to violence, while long-term exposure to pollutants may contribute to chronic diseases that shorten life expectancy.

Additionally, the interplay between socioeconomic inequality and life expectancy remains an important area of study. While the relationship between poverty, income inequality, and life expectancy has been well established, the role of government policies and social welfare programs in mitigating these disparities requires further investigation. Policies that improve education, employment opportunities, and healthcare access could contribute to reducing regional disparities in life expectancy.

Conclusion

This systematic literature review analyzed 25 studies to identify the determinants of life expectancy in Indonesia. The findings highlight that life expectancy is influenced by health infrastructure, socioeconomic factors, demographics, political stability, and environmental conditions. Among these, health infrastructure—including the availability of health workers, hospitals, and health insurance—plays a key role in shaping longevity. Socioeconomic conditions, such as education, employment, and economic growth, also significantly impact life expectancy by affecting access to healthcare and overall well-being. However, critical research gaps remain. Compared to global studies, Indonesian research has not extensively examined factors such as malnutrition, food insecurity, stunting, access to essential medicines, unmet healthcare needs, self-medication, and crime rates. Additionally, environmental factors like pollution, climate change, and sanitation require further investigation to assess their long-term impact.

Future research should take a holistic approach, integrating these additional variables and using longitudinal data to assess the effects of policy interventions. Investigating regional disparities, healthcare accessibility, and government policies will be essential for improving public health outcomes. Addressing these gaps will provide a comprehensive understanding of longevity determinants and contribute to evidence-based policies aimed at increasing life expectancy in Indonesia.

Conflict of Interest

The authors declare that they have no competing interests.

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