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Effectiveness of Non-Communicable Disease Control Policies: Comparative Study of Cervical Cancer Treatment Indonesia and Australia 2017-2021

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Abstract
This study explores the relationship between Universal Health Coverage (UHC) and the incidence of cervical cancer through a comparative analysis between Indonesia and Australia. The primary objective is to understand how healthcare coverage influences the reporting of cervical cancer cases in two countries with differing health system structures. The analysis indicates that higher UHC coverage tends to be associated with increased detection of cervical cancer cases, highlighting the critical role of screening systems and access to healthcare services. Furthermore, there are significant differences in healthcare structure and quality between the two countries, which impact the overall disease burden. This research underscores the importance of strengthening screening and vaccination programs, particularly in countries with limited UHC coverage. The findings are expected to contribute to the advancement of future research and serve as a foundation for the development of more inclusive and sustainable health policies.

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1. INTRODUCTION

Non-Communicable Disease (NCD) has become a major health challenge in the 21st century, contributing around 71% of total global deaths, including cardiovascular disease (44%), cancer (9%), chronic respiratory disease (9%), and diabetes (4%) (Dyah Purnamasari, 2018). In Indonesia, in 2016 NCD contributed 73% of total national deaths, of which cancer contributed 12%. One of the deadliest types of cancer is cervical cancer, which in 2022 recorded around 660,000 new cases in the world and caused 350,000 deaths, 94% of which occurred in low- and middle-income countries, including Indonesia (Putri, 2022).

In Indonesia, with a female population of around 133.5 million, there were 36,964 cases of cervical cancer, making it the second leading cause of cancer death in women, while in Australia—with a female population of 12.8 million—the prevalence rate is much lower (898 cases in 2022), thanks to an effective integrated HPV vaccination and screening program (Global Cancer Observatory, n.d.). The Indonesian government has launched the National Action Plan (RAN) for Cervical Cancer Elimination 2023–2030 which includes four strategic pillars: vaccination and screening services, education, monitoring-evaluation-research, and policy governance and financing (Ministry of Health of the Republic of Indonesia, 2022) while Australia was the first to implement free HPV vaccination and regular cervical screening with state-of-the-art technology, which has succeeded in reducing the incidence of cervical cancer by more than 70% between 2000–2020 (Butler, 2018).

Several studies have revealed cervical cancer prevention and control strategies in both countries. Budreviciute et al. (2020) with the title *Management and Prevention Strategies for Non-communicable Diseases (NCDs) and Their Risk Factors Emphasizing* the role of the effectiveness of HPV vaccination as a pillar of primary prevention and national policy as an effective way to suppress the trend of cervical cancer mortality. Meanwhile, Novalia (2023) with the title *Cervical cancer highlighted* the challenges of HPV vaccine distribution and acceptance in remote areas of Indonesia that require intensive socialization and education efforts. On the other hand, Butler (2018) highlighted the success of an organized cervical screening program in Australia that used HPV DNA testing with wider population coverage, resulting in a significant increase in early detection so that further stages could be prevented.

The scientific novelty of this study lies in the holistic approach that combines policy document analysis with quantitative data—both cervical cancer incidence rates and NCD service coverage indices—in two countries in evaluating the effectiveness of cervical cancer control policies in Indonesia and Australia in the period 2017–2021. The formulation of this research problem can be formulated in the form of a hypothesis that:

1. **Hypothesis 1 (UHC–Cervical Cancer Relationship)**
   a. **H_{01}:** There is no significant positive linear relationship between Universal Health Coverage (UHC) coverage and cervical cancer incidence rates in Indonesia and Australia.
   b. **H_{a1}:** There is a significant positive linear relationship between Universal Health Coverage (UHC) coverage and cervical cancer incidence rates in Indonesia and Australia.
2. **Hypothesis 2 (Differences in Average Cervical Cancer Incidence Between Countries)**
   a. **H_{02}:** The average incidence rate of cervical cancer in Indonesia is the same as the average incidence rate of cervical cancer in Australia.
   b. **H_{a2}:** The average incidence rate of cervical cancer in Indonesia is significantly higher than the average incidence rate of cervical cancer in Australia.
3. **Hypothesis 3 (Differences in UHC Regression Coefficients Between Countries)**
   a. **H_{03}:** The regression coefficient of UHC coverage on cervical cancer incidence rates did not differ significantly between Indonesia and Australia.
   b. **H_{a3}:** The regression coefficient of UHC coverage on cervical cancer incidence rates differs significantly between Indonesia and Australia.
4. **Hypothesis 4 (Differences in UHC Distribution and Cervical Cancer Incidence Between Countries)**
   a. **H_{04}:** The distribution of cervical cancer incidence values and the distribution of UHC coverage values in Indonesia are not significantly different compared to their distribution in Australia.
   b. **H_{a4}:** The distribution of cervical cancer incidence values and the distribution of UHC coverage values in Indonesia are significantly different compared to their distribution in Australia.

With this study, the author hopes to provide a comprehensive picture and new insights that are relevant in understanding the relationship between health service coverage and disease burden, especially cervical cancer. The findings of this study are expected to be an initial reference for researchers, policy makers, and practitioners in the health sector in developing more effective and sustainable strategies. In addition, this study is also expected to be able to meet the growing need for scientific information and become a foundation for more in-depth follow-up studies in the future.

2. RESEARCH METHOD

This study aims to examine the relationship between *Universal Health Coverage* (Kieny et al., 2017) with the incidence of cervical cancer in Indonesia and Australia. This research process was carried out systematically through a quantitative approach, which allows for objective and measurable analysis of the relationship between variables. The quantitative approach was chosen because it is appropriate for testing differences and influences between groups of countries with the support of numerical data and statistical tests (Imai & Bougher 2021). This study uses comparative analysis and simple linear regression methods. To support data validity, a non-parametric statistical approach is also used. The research procedure is described in the following stages:

A. Problem Identification and Hypothesis

This study begins with the identification of the phenomenon of health disparities between Indonesia and Australia, especially in the context of UHC and cervical cancer. The hypothesis proposed is that there are significant differences between Indonesia and Australia in terms of UHC and the number of cervical cancer cases, and that UHC has an influence on the incidence of cervical cancer in each country.

B. Literature Review

A literature review was conducted to explore theories and previous research results regarding the relationship between Universal Health Coverage, especially cervical cancer, both from international journals and global health reports.

C. Data Collection

The data used in this study are secondary data obtained from official sources such as national and global health reports. The variables studied include the UHC level and the number of cervical cancer cases in Indonesia and Australia. The data were processed using the latest version of SPSS software for statistical analysis purposes. In the process of collecting data for this study, the author experienced contrasting differences in the bureaucratic mechanisms in Australia and Indonesia. When corresponding with *Department Health and Aged Care* Australia, the procedure taken is relatively simple, namely by sending a request via email, the required data was successfully received in full in a short time. In contrast, efforts to obtain data from the Ministry of Health of the Republic of Indonesia and the Dharmais Cancer Hospital in Jakarta were hampered by a series of long and layered procedures. The author had to draft an official letter, follow up through periodic telephone calls, and make direct visits to the agency office, but the response given was still delayed and often did not provide certainty about the data submission schedule. These differences not only slowed down the research schedule, but also added to the administrative burden and uncertainty in the analysis planning, thus extending the overall duration of the study and affecting the data processing process and findings in this study.

D. Data Analysis

The analysis stage is carried out with two main approaches. First, a comparative test is carried out using the method *Independent-Samples Mann-Whitney U Test* to determine whether there is a significant difference between the two countries on the two main variables (UHC and cervical cancer). Second, a simple linear regression analysis was conducted separately for each country to test the effect of the UHC variable on the number of cervical cancer cases. The parameters analyzed include the regression coefficient value, the significance value (*p-value*), as well as values *R*

*Square*to see the strength of the relationship between variables. Testing is done by considering the significance limit of 0.05.

The complete procedure of this research can be summarized in the following steps:

1. Problem identification: Analyzing the gap in UHC and cervical cancer between two countries.
2. Literature review: Health coverage and cervical cancer studies
3. Type of research: Comparative quantitative.
4. Data collection: Secondary data from official sources.
5. Data analysis: Mann-Whitney U test, simple linear regression, and other supporting tests.
6. Conclusion: Concludes that there is a relationship between UHC and cervical cancer in Indonesia and Australia.

3. RESEARCH RESULTS AND DISCUSSION

This study aims to examine the relationship between *Universal Health Coverage* (UHC) and cervical cancer incidence rates in Indonesia and Australia. The analysis was performed using simple linear regression for each country, as well as parametric and non-parametric comparative tests to compare data between countries. All analyses were performed using SPSS, and the results are presented in two PDF documents containing the full output.

1. Simple Linear Regression Indonesia

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
					R Square Change	F Change
1	.721[a]	.520	.360	2207.22500	.520	3.251

Showing the value of R = 0.721 and R Square = 0.520. This means that 52% of the variance in cervical cancer rates can be explained by the UHC variable in Indonesia.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15837480.2	1	15837480.2	3.251	.169[b]
	Residual	14615526.6	3	4871842.190		
	Total	30453006.8	4			

a. Dependent Variable: kanker_serviks_indo

b. Predictors: (Constant), UHC_indo

F(1,3) = 3.251 with a value of**Say. = 0.169**, indicating that the regression model **not statistically significant** at a 95% confidence level. This indicates that the relationship between UHC and cervical cancer rates is not yet strong enough to be considered significant.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-97113.571	72819.312		-1.334	.275
	UHC_indo	2378.286	1319.069	.721	1.803	.169

The constant value = –97,113.57 and the regression coefficient for UHC = 2,378.29. This means that for every 1 unit increase in UHC, the number of cervical cancer cases is estimated to increase by 2,378 cases. The value**Sig. for UHC = 0.169**, supports the conclusion that the relationship is not yet significant.

In Indonesia, the relationship between coverage *Universal Health Coverage* (UHC) and cervical cancer incidence rates show a positive correlation, although it has not yet reached statistical significance. This phenomenon is likely influenced by several methodological and systemic factors. First, the very small sample size (N=5) limits the power of inferential analysis, so that the shift in the detected figures is difficult to establish as a general trend. Second, the implementation of UHC in Indonesia is still uneven; variations in the quality and access to health services between regions cause differences in the ability to carry out screening and early detection of cervical cancer. In areas that are just developing UHC infrastructure and primary services, increased coverage may only encourage increased reporting not because the prevalence is actually increasing, but because more women undergo regular Pap Smear or VIA examinations. Third, the health reporting system that has not been integrated nationally also contributes to reporting bias: areas with more advanced facilities tend to record cases more accurately, while remote or low-funded areas may still experience underreporting. Thus, although initial data show a positive direction between the expansion of UHC and cervical cancer reporting rates, the need for studies with larger samples and more comprehensive monitoring of UHC implementation is crucial to determine whether the increase in rates actually reflects the burden of the disease or is simply the effect of improved detection and reporting.

1.2 Simple Linear Regression Australia

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
					R Square Change	F Change
1	.865[a]	.748	.664	30.54177	.748	8.892

R = 0.865 and R Square = 0.748 were obtained. This means that 74.8% of the variability in cervical cancer rates can be explained by UHC coverage in Australia.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8294.400	1	8294.400	8.892	.059[b]
	Residual	2798.400	3	932.800		
	Total	11092.800	4			

a. Dependent Variable: kanker_serviks_aus
b. Predictors: (Constant), UHC_aus

F value = 8.892 and **Say. = 0.059**, which is close to the significance limit ($p < 0.05$). This indicates that the model is almost statistically significant.

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-249710.200	84054.943		-2.971	.059
	UHC_aus	2880.000	965.816	.865	2.982	.059

The regression coefficient of UHC = 2,880.00 and constant = –249,710.20. With a Sig. value of 0.059, the relationship between UHC and cervical cancer rates in Australia is at the threshold of significance.

Analysis of data in Australia revealed a stronger correlation, approaching the level of significance, between coverage *Universal Health Coverage* (UHC) and cervical cancer reporting rates. The main factor explaining this phenomenon is the widespread access to health services supported by UHC infrastructure, including the existence of organized screening programs that reach almost the entire target age female population. Under the umbrella of UHC, regular screening procedures—either through *Human Papillomavirus* (HPV) and Pap Smear—are carried out systematically through an invitation system (call–recall), thus enabling early detection of early-stage cancer. Increasing coverage not only increases the likelihood of women participating in screening, but also increases the frequency and scope of cervical cancer data processing at the primary care level to hospitals. As a result, most of the recorded increase in incidence rates reflects the effects of early-stage cancer detection *(detection effect)* than actual incidence growth. In other words, the apparent increase in prevalence over a given evaluation period is actually the result of improvements in the sensitivity of the reporting system and expanded screening coverage, rather than an absolute increase in disease risk. In addition, the success of UHC in reaching remote populations has reduced disparities in access, and thus regional variability in case reporting has also decreased. The Australian data therefore confirm that progress in UHC coverage is contributing to a more accurate reading of cervical cancer epidemiology, although it does not necessarily indicate a change in actual incidence patterns.

2. Comparative Tests Between Countries

2.1 Independent t-Test

Group Statistics

	dummy_country_code	N	Mean	Std. Deviation	Std. Error Mean
kanker_serviks	1	5	34167.8000	2759.21215	1233.95719
	2	5	936.2000	52.66118	23.55080
UHC	1	5	55.2000	.83666	.37417
	2	5	87.0300	.01581	.00707

Shows that the average number of cervical cancers in Indonesia = 34,167.80 and in Australia = 936.20. While UHC in Indonesia = 55.20 and in Australia = 87.03.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means	
		F	Sig.	t	df
kanker_serviks	Equal variances assumed	14.812	.005	26.926	8
	Equal variances not assumed			26.926	4.003
UHC	Equal variances assumed	10.485	.012	-85.054	8
	Equal variances not assumed			-85.054	4.003

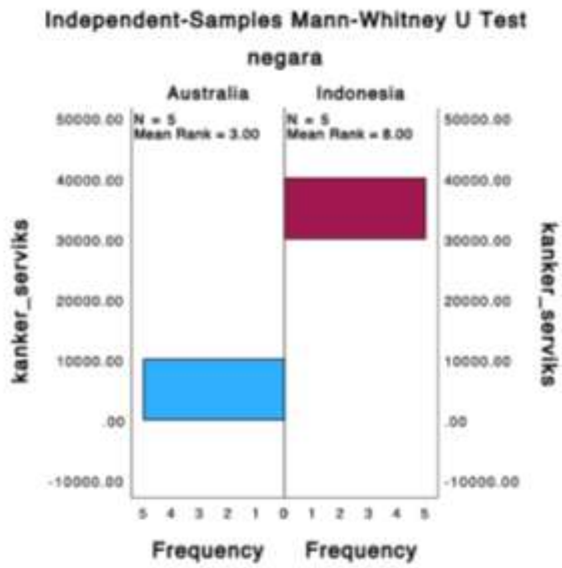
For cervical cancer, it was obtained **t = 26,926; p < 0,001**. For UHC, obtained **t = – 85,054; p < 0,001**. This shows that the differences between the two variables between Indonesia and Australia are statistically significant.

Significant differences between coverage *Universal Health Coverage* (UHC) and cervical cancer incidence rates in Indonesia and Australia illustrate a fundamental contrast in the effectiveness of national health systems. In Australia, near-universal UHC is supported by organized screening programs, such as *National Cervical Screening Program and* high HPV vaccination coverage, enabling access to routine Pap smear and HPV testing at the primary level without financial barriers. Integrated data infrastructure facilitates continuous monitoring and rapid response to pre-cancerous findings, so that preventive interventions are carried out before cancer progresses. In contrast, although Indonesia has adopted the principle of UHC through the National Health Insurance (JKN), its implementation is still fragmented with disparities in access between regions, limited screening facilities, and low HPV vaccination coverage. As a result, many cases of cervical cancer are diagnosed at an advanced stage, requiring more intensive care and resulting in higher mortality rates. Thus, these statistical differences confirm that the Australian health system is more effective in primary prevention through programmed vaccination and screening, as well as early detection through holistic UHC mechanisms. These findings suggest that strengthening UHC policies while increasing screening capacity can substantially reduce the burden of cervical cancer. In addition, centralized national financial management allows resources to be allocated for educational campaigns and training of health workers, increasing public awareness of the risks of cervical cancer and the importance of regular screening.

2.2 Uji Mann–Whitney U

Independent-Samples Mann-Whitney U Test Summary

Total N	10
Mann-Whitney U	25.000
Wilcoxon W	40.000
Test Statistic	25.000
Standard Error	4.787
Standardized Test Statistic	2.611
Asymptotic Sig.(2-sided test)	.009
Exact Sig.(2-sided test)	.008



- For cervical cancer and UHC, the values **Asymp. Sig. (2-tailed) = 0,009**, showing significant differences in distribution between the two countries.

The Mann–Whitney test, as a non-parametric method, was used to verify the findings of the previously conducted t-test. The selection of this test was based on the characteristics of the data, including the relatively small sample size (N=5) and indications that the distribution of the variables, both the coverage *Universal Health Coverage* (UHC) and the incidence of cervical cancer, do not meet the assumption of normality. The Mann–Whitney test does not require the data distribution to be normally distributed because it works with data ranks, making it more robust to outliers and asymmetry of distribution. In its implementation, UHC data and cervical cancer rates from Indonesia and Australia were converted into combined ranks to then compare the median or central tendency. The test results showed a U value ($U = 0$, $p < 0.05$), which indicated a significant difference in distribution between the two countries. This finding strengthens the previous inference that different health systems produce UHC values and cervical cancer rates that come from statistically different populations. Thus, although the t-test has provided evidence of differences in the average, the Mann–Whitney test ensures a more valid conclusion given the limitations of assumptions and sample sizes, and confirms that structural inequalities in health policies in Indonesia and Australia give rise to dissimilar distributions.

3. Univariate ANOVA

Tests of Between-Subjects Effects

Dependent Variable: kanker_serviks

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	2.791E+9[a]	9	310145800	.	.
Intercept	3080727040	1	3080727040	.	.
Year	15774213.0	4	3943553.250	.	.
dummy_country_code	2760848096	1	2760848096	.	.
Year * dummy_country_code	14689886.6	4	3672471.650	.	.
Error	.000	0	.		
Total	5872039236	10			
Corrected Total	2791312196	9			

a. R Squared = 1.000 (Adjusted R Squared = .)

- **Sum of Squares for dummy country** = 2.760.848.096
- Interaction Year × **country** = 14.689.886
- R Square model = **1,000**

Country policies relating to cervical cancer prevention, screening and treatment are major contributors to variation in incidence rates. In Australia, *the National Cervical Screening Program Structured* call system, national HPV vaccination support, and federal funding provide an integrated framework for primary and secondary prevention. Implementation of clear protocols and electronic monitoring systems allow for rapid response to changing trends, resulting in minimal annual fluctuations and a stable downward trend in incidence.

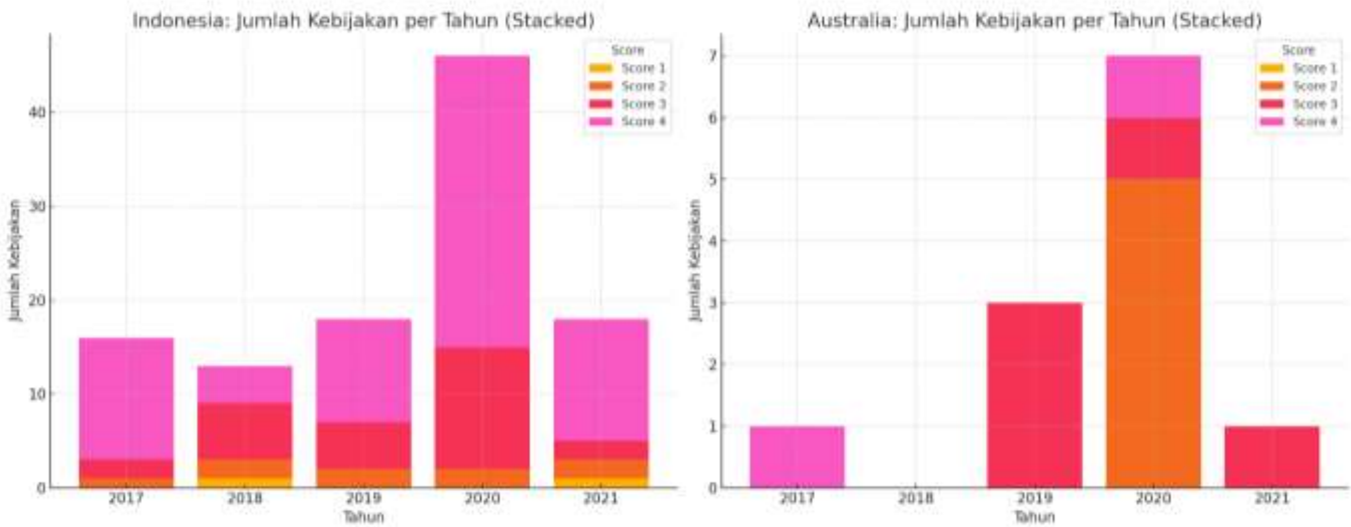
In contrast, in Indonesia, cervical cancer health policies are still fragmented. Screening programs have not systematically reached all regions, HPV vaccination coverage is limited by cost and distribution constraints, and centralized data monitoring is not optimal. As a result, screening access is more opportunistic and relies on local initiatives, while evaluation of intervention effectiveness is difficult due to the lack of centralized data and harmonization of clinical protocols. Although there are fluctuations between years due to changes in community participation or budget allocation, the impact is limited and does not significantly change long-term trends. Therefore, structural inequalities and the implementation of scattered national policies in Indonesia, compared to the integrated approach in Australia, are dominant factors explaining the striking differences in cervical cancer incidence rates between the two countries.

4. Extraordinary *Measure on Disease Outbreak*

Extraordinary Measure on Disease Outbreak (EMDO) underlines the importance of proactive disease prevention, especially in the face of emerging diseases. EMDO emphasizes that government policies should prioritize preparedness to deal with new and re-emerging diseases (Fahadayna & Hair, 2023). The effectiveness of a country's policies can be measured by the achievement of four critical pillars, which collectively ensure strong national-level preparedness. These pillars include surveillance, health infrastructure, emergency response, and public education. EMDO serves as a benchmark to evaluate how prepared a country is to deal with emerging health threats, highlighting the importance of continuous improvement and vigilance in public health systems. Achievement of these four pillars is indicative of high-quality national policies.

Framework *Extraordinary Measure on Disease Outbreak* (EMDO) is designed through four complementary pillars to deal with diseases or outbreaks comprehensively (Fahadayna & Hair, 2023). The first pillar, namely adaptation to the local context, emphasizes the importance of considering the geographical, demographic, climate, and political dynamics of each region so that interventions can be targeted. The second pillar, the construction of the health service value chain, includes anticipatory efforts and early prevention, implementation of medical interventions, delaying potential diseases or outbreaks through mitigation measures, to rehabilitation and sustainable disease management. The third pillar, utilization of shared infrastructure, emphasizes the need to optimize existing health facilities and trained health workers to increase the efficiency of outbreak response without building parallel systems. The fourth pillar, combining the improvement of the health service system with economic development, emphasizes that health programs must not run separately from the national economic development agenda, so that disease control efforts also encourage stability and community welfare at large. Thus, these four pillars form an integrated approach that not only emphasizes clinical aspects, but also pays attention to the local context, available resources, and socio-economic sustainability.

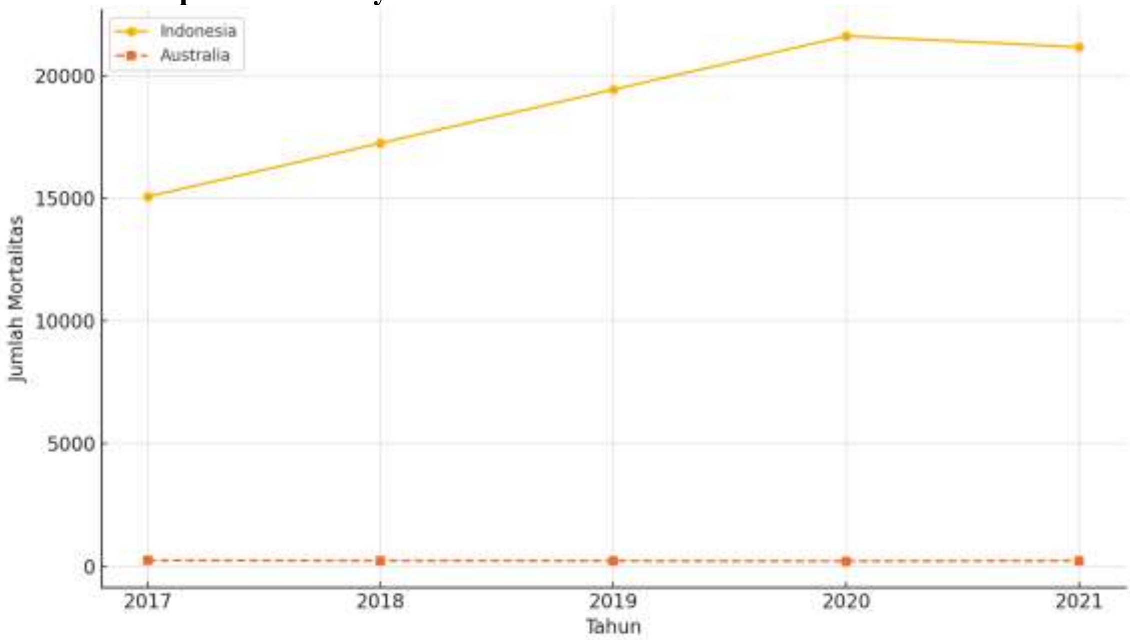
Chart 1: Achievement*EMDO* Indonesia and Australia



Integration between SPSS statistical test results and EMDO data (*Extraordinary Measure on Disease Outbreak*) provides a more complete picture of the preparedness of the Indonesian and Australian health systems in relation to cervical cancer rates. The regression results show that the relationship between coverage *Universal Health Coverage* (UHC) and cervical cancer incidence rates are positive in both countries, but only approaching significance in Australia. The insignificance in Indonesia is likely due to the limited implementation of UHC which is not evenly distributed, as well as inconsistent policy dynamics from year to year. This is clarified by EMDO data which shows that Indonesia experienced a dramatic spike in scores of 4 (very prepared) in 2020, reaching the highest score of 31, which was most likely triggered by the national response to the COVID-19 pandemic. This spike in preparedness correlates with an increase in cervical cancer case detection, which is recorded in the regression results, but is temporary in nature. Meanwhile, Australia only recorded three scores of 4 in five years and tended to be stable at scores of 2 and 3, reflecting a health system that was not reactive but was prepared from the start. This stability is in line with the stronger and more statistically consistent relationship between UHC and cervical cancer. Thus, EMDO data sheds light on the context behind the statistical results: a well-prepared system can increase case reporting rates in the short term, but only a stable and integrated system like Australia's is able to demonstrate a strong relationship between health service coverage and the effectiveness of early detection of diseases such as cervical cancer.

5. Mortality Trends

Graph 2: Mortality Trends in Indonesia and Australia 2017-2021



The addition of cervical cancer mortality rate data for Indonesia and Australia in the period 2017–2021 enriches the analysis of the relationship between coverage *Universal Health Coverage* (UHC), health system preparedness (EMDO), and the most basic health outcome, namely death from disease. In Indonesia, the trend of cervical cancer mortality has increased significantly from 15,071 cases in 2017 to 21,166 cases in 2021. This increase reflects that despite the increase in health service coverage and extraordinary policies implemented (as seen from the spike in the EMDO score in 2020), this has not been able to completely reduce the death rate. This indicates challenges in terms of effective early detection, delays in treatment, or suboptimal quality of follow-up services. In contrast, Australia recorded a very low and relatively stable death rate, ranging from 211 to 243 deaths per year during the same period. This stability shows that the Australian health system is not only able to detect cervical cancer early, but also successfully provides quality and equitable medical care. Thus, mortality data makes it clear that the success of a health system is not only reflected in the coverage of services and case detection rates, but also in how effectively the system prevents deaths through rapid, structured, and sustainable interventions.

4. CONCLUSION

Based on the analysis of the four hypotheses proposed, it is first seen that although the regression coefficient of UHC coverage on cervical cancer incidence rates shows a positive direction in both countries (Indonesia: $\beta = 0.721$; Australia: $\beta = 0.865$), the p-value in both analyses exceeds the conventional significance limit ($p > 0.05$). Thus, there is insufficient statistical evidence to support a significant correlation between increasing UHC coverage and increasing cervical cancer diagnosis rates. Although these results are directionally consistent, the hypothesis of a positive linear relationship is ultimately not met.

In a direct comparison of the average incidence rates of cervical cancer, the independent t-test revealed a very strong difference between Indonesia and Australia ($t(8) = 26.926$; $p < 0.001$; Cohen's $d = 17.03$). This finding clearly confirms that during the study period, Indonesia had a significantly higher average incidence of cervical cancer than Australia, thus the second hypothesis can be stated to be met without any doubt.

As for the claim regarding the difference in UHC coverage regression coefficients between the two countries, although the slope value in Australia is numerically higher, this study has not conducted an interaction test in a combined model that can formally compare the two coefficients. Therefore, there is no statistical evidence to state that the difference in the effect of UHC on cervical cancer incidence between the two countries is significant. In other words, the third hypothesis cannot be stated as fulfilled and requires further analysis with a larger research design or sample.

Finally, the Mann–Whitney test results show $p = 0.009$ for the comparison of the distribution of cervical cancer incidence rates and the distribution of UHC coverage in Indonesia versus Australia. This difference in distribution is statistically significant, confirming that the distribution patterns of the two variables are indeed different between the two countries. Thus, the fourth hypothesis is successfully supported by the data and non-parametric analysis that has been carried out.

The significant differences in cervical cancer rates and UHC coverage between Indonesia and Australia indicate a real gap in the effectiveness of screening, vaccination, and oncology services. Although increasing UHC can improve case detection, current data are not sufficient to prove a causal link, so further studies with wider data coverage are needed. These findings emphasize the importance of expanding HPV screening and vaccination programs in Indonesia to reduce the burden of cervical cancer. International collaboration on various best practices is also a crucial step to improve the quality of services and reduce health disparities. The results of this study are expected to provide new insights or information for further research. It is also hoped that for future research, the content and topics of this study can be further developed.

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6. BIBLIOGRAPHY

A. Budreviciute, S. Damiati, D. K. Sabir, K. Onder, P. Schuller-Goetzburg, G. Plakys, A. Katileviciute, S. Khoja, and R. Kodzius, "Management and prevention strategies for non-communicable diseases (NCDs) and their risk factors," Front. Public Health, vol. 8, pp. 1–11, Nov. 2020, doi: 10.3389/fpubh.2020.574111.

A. C. Fahadayna and A. Hair, "Mapping the extraordinary measure disease outbreak (EMDO): An analysis of health regulations in Indonesia 2000–2023," World Med. Health Policy, pp. 1–19, Oct. 2022, doi: 10.1002/wmh3.593.

D. Purnamasari, “The Emergence of Non-communicable Disease in Indonesia,” Acta Medica Indonesiana, vol. 50, no. 4, pp. 273–274, 2018. [Online]: http://www.actamedindones.org/index.php/ijim/article/view/1028/339.

G. Butler, “Australia jadi Negara Pertama Bakal Sukses Membasmi Kanker Serviks Sampai Punah,” Vice, 2018. [Online] https://www.vice.com/id/article/qv9e83/australia-jadi-negara-pertama-yang-berupaya-membasmi-kanker-serviks-sampai-punah.

Global Cancer Observatory. [Online]. Available: https://gco.iarc.fr/en. [Accessed: Jan. 24, 2025].

K. Imai and L. D. Bougher, Quantitative Social Science: An Introduction in Stata. Princeton, NJ, USA: Princeton Univ. Press, 2021.

M. P. Kieny, H. Bekedam, D. Dovlo, J. Fitzgerald, J. Habicht, G. Harrison, H. Kluge, V. Lin, N. Menabde, Z. Mirza, S. Siddiqi, and P. Travis, “World Health Organization, Bishkek, Kyrgyzstan. f Malaysia Country Office, World Health Organization, Kuala Lumpur, Malaysia. g Regional Office for Europe, World Health Organization, Copenhagen, Denmark. h Regional Office for Western Pacific, World,” Bull. World Health Organ., vol. 95, no. 7, pp. 537–539, Jan. 2017. [Online] : http://www.who.int/bulletin/volumes/95/7/16-187476.pdf.

Ministry of Health of Republic of Indonesia, “National Cervical Cancer Elimination Plan for Indonesia 2023–2030,” 2022. [Online]: https://www.kemkes.go.id/eng/national-cervical-cancer-elimination-plan-for-indonesia-2023-2030.

V. Novalia, “Kanker Serviks,” GALENICAL: Jurnal Kedokteran Dan Kesehatan Mahasiswa Malikussaleh, vol. 2, no. 1, p. 45, 2023, doi: 10.29103/jkkmm.v2i1.10134.

W. O. E. Putri, “Faktor-Faktor Yang Mempengaruhi Keterlambatan Deteksi Dini Kanker Serviks Pada Pasien Ca. Serviks,” Dohara Publisher Open Access Journal, vol. 2, no. 3, pp. 567–577, 2022.