

DISPARITIES IN SANITATION AND DIARRHEA AMONG THE UNDER-5 AGE IN INDONESIAN HOUSEHOLD

Rina K Kusumaratna¹, Almira Anasa²

^{1,2}Departemen Kesehatan Masyarakat Fakultas Kedokteran Universitas Trisakti, Jakarta, Indonesia

ABSTRAK

Akses terhadap sumber air bersih merupakan kebutuhan utama manusia, dan merupakan tanggung jawab negara untuk memastikan bahwa seluruh warga negara mempunyai akses terhadap sumber air bersih yang layak. Penelitian ini bertujuan untuk menganalisis akses sanitasi yang aman terkait penyakit diare pada tingkat rumah tangga di pedesaan dan perkotaan berdasarkan data SDKI 2017. Desain studi analitik, cross-sectional dengan menggunakan database Survei Demografi dan Kesehatan Indonesia (SDKI)-2017 dari Badan Survei Demografi dan Kesehatan, pada bulan Oktober hingga Desember 2022. Sebanyak 2.359 dari 16.615 total sampling balita dari database rumah tangga diambil sub-set sampling balita yang menderita diare. Instrumen yang digunakan adalah data spesifik SDKI pada bagian rumah tangga dan perempuan Wanita Usia Subur (WUS), umur anak, jenis kelamin, pendidikan ibu, wilayah tempat tinggal, fasilitas jamban, dan sumber air minum sebagai akses terhadap kebutuhan sanitasi. Dilakukan analisis deskriptif dan uji chi-square dengan software SPSS versi 25 dan tingkat kemaknaan <0,05. Kegagalan menjaga pasokan air bersih dapat menyebabkan epidemi penyakit yang ditularkan melalui air akibat dari kontaminasi tinja pada sumber air bersih. Penyebabnya karena pengelolaan limbah padat tempat tinggal yang buruk, berdampak terutama pada populasi berisiko tinggi seperti anak balita. Situasi ini bukan hanya menjadi tanggung jawab sektor kesehatan namun juga peran lintas sektoral lainnya. Tanpa kerja sama yang baik dan pembagian tanggung jawab, permasalahan kesehatan terkait WASH tidak akan terselesaikan sepenuhnya.

Kata kunci: Akses Sanitasi; Diare; Tingkat rumahtangga; Balita

ABSTRACT

Access to clean water sources is a major human need, and it is the responsibility of the state to ensure that all citizens have access to the proper source of clean water. The study aims to analyze safe access of sanitation related to diarrheal disease in rural and urban areas based on IDHS 2017 data at the National household level. An analytical, cross-sectional design by using a database of Indonesia's Demographic and Health Survey (IDHS)-2017 from the Demographic and Health Survey Agency, from October to December 2022. By total sampling of under-5 children from the household database, and sub-set sampling of 2.359 under-5 with diarrhea out of 16.615. The instruments used were specific data of IDHS questionnaires on household and women's section i.e. women of childbearing age (WUS), children's age, sex, mother's education, area of residence, latrine facilities, and sources of drinking water as access to sanitation of requirement. The analysis was performed by descriptive and chi-square test analysis with software of SPSS version 25 and a significance level of <0.05. Failure to maintain the integrity of the water supply could develop epidemics of waterborne diseases, illnesses, and transmitted diseases through fecal contamination of drinking water. The overflow of wastewater into open fields and ditches or the mismanagement of solid waste of human habitation could result in vector-borne diseases, especially for high-risk populations such as the U-5 children. This situation is not only the health sector's responsibility but also other sectoral roles. Without good cooperation and sharing of responsibilities, health problems related to WASH will not be completely resolved.

Keywords: Access Sanitation; Diarrhea; Household-level; Under-5

▪

***Korespondensi penulis:**

Nama: Rina K Kusumaratna

Instansi: Departemen Kesehatan Masyarakat, Fakultas Kedokteran Universitas Trisakti

Alamat: Kampus B, Lantai 4 fakultas Kedokteran, Jalan Kyai Tapa, Grogol, Jakarta Barat 11440, Indonesia

Email: rkusumaratna@trisakti.ac.id

Introduction

In Indonesia by the year 2030, two-thirds of the total population is predicted to live in cities and experience rapid urbanization and a shift in population. The Indonesian government has made a major national commitment to child welfare, including a commitment to realizing the 2030 Agenda for Sustainable Development. The Development Plan National Medium Term (RPJMN) 2020–2024 prioritizes investment for human development, including providing health services, birth registration, social protection, education (including the development of early childhood at the village level), and child protection.(1)

Urbanization will have a significant impact also on children. Diseases and poverty are also known as linked as a vicious cycle due to urbanization. Poverty is the cause of almost all challenges faced by children in Indonesia, such as health conditions, school opportunities, circumstances safe from violence and exposure to harmful pollutants, and much more. Although poverty in Indonesia has generally declined over the past decade, inequality has sharpened. The child is the group most affected by poverty more than the rest of the population. The poverty situation in Indonesia could not be separated from the spatial dimension, with significant differences between urban and rural areas.(2) The poverty rate in rural areas is higher than in urban areas. Compared to urban areas, children living in rural areas are much more at risk of experiencing not only poverty in terms of income, but also various forms of deprivation, such as lack of sanitation facilities, incomplete immunization, lack of health insurance, inadequate nutrition,

lack of opportunity to get basic education, births are not recorded, in-adequate housing conditions, and so on.(3,4) However, access to water, sanitation, and hygiene (WASH) still remains an interesting issue to resolve.

The absence of clean water sources, hand washing facilities, and latrines in most health posts and delivery clinics shows that the difficult-to-reduce neonatal mortality rate may be closely related to the lack of basic hygiene facilities. Under-five mortality fell from 93 deaths per 1000 live births (1990) to only 39 per 1000 live births (2018). However, Pneumonia (15%), diarrhoea (8%), and malaria (5%) continue to be among the primary causes of mortality in children under age of five, accounting for over one-third of all U-5 mortality rate worldwide.(4) To obtain the greatest health benefits, improvements in sanitation and hygiene must be carried out, in addition to the need for adequate access to clean water. Adequate and equitable access to water, sanitation, and hygiene facilities is very important to preventing disease. Ensure that the results of health, nutrition, and development efforts can be felt by the children.(2,5)

Indonesia has shown significant progress in improving access to adequate water supplies and sanitation across the country and demonstrates a strong commitment to continuously improving the quality of sanitation access by promoting *Sanitasi Total Berbasis Masyarakat (STBM)* or Community Total Led Sanitation (CTLS) lead former by Chamber study.(6,7)

STBM is made up of five pillars, such as Stop Defecating Randomly Large (*BABS*), Wash Hands with Soap (*CTPS*), Household Drinking

Water and Food Management (*PAMMRT*), Home Waste Management Stairs (*PSRT*), and Household Wastewater Management (*PALRT*). The *STBM* as a National Strategy includes outcome indicators, such as lowering the prevalence of diarrheal illnesses and other environmental diseases linked to sanitation and behavior. Services access to WASH varies across regions and between socio-economic groups.(8,9)

There are many known diseases related to poor sanitation and hygiene practices, such as diarrhea, cholera, dysentery, shigellosis, salmonellosis, typhoid, hepatitis, trachoma, and soil-transmitted diseases. Diarrhea disease, which mainly results from poor water quality, sanitation, and hygiene, is the major cause of death for children under five in Indonesia. The majority of the Indonesian population, only 89% have access to a minimum of basic drinking water services (i.e. decent drinking water, which is a total of 30 minutes of a journey back and forth in several areas).(10) Estimated, only three-quarters of Indonesia's population can access at least basic sanitation facilities with significant variation between rural and urban areas. The definition of "access to safely managed sanitation" according to the Ministry of Health of Indonesia includes households with access to proper sanitation on their own property, whether connected to the exhaust system or septic tank with desludging service for the last five years. If the stricter definition of WASH targets according to the SDGs is applied, the access rate will drop drastically. Another challenge in providing safe-managed sanitation services is due to a low level of public awareness of the importance of safe sanitation. Disease reduction also leads to savings for communities of health care and chronic illnesses. This study aims to analyze and evaluate safe access to sanitation related to diarrheal disease in rural and urban areas based on IDHS 2017 data at the national household level.

Method

Study design and sampling method

The study used a cross-sectional and analytical method, examining secondary data from the 2017 Indonesian Health Demographic Survey (IDHS). Based on the definition supplied by the *Badan Pusat Statistik (BPS)* of the Republic of Indonesia, we utilized the phrase area of comparisons between urban and rural. The IDHS_2017 sample was intended to be representative of the national, provincial, urban, and rural levels. Samples were collected from 1970 blocks in 34 Indonesian provinces, including urban and rural. With 25 families per census block, the estimated number of household samples was 49250. It is made up of 25,300 urban household samples and 23,950 rural household samples. The minimum sample size reference that must be satisfied for the average Relative Standard Errors (RSE) estimate of 3.5%, after which the total household sample for each province is determined. The 2017_IDHS samples were stratified by province and urban/rural categorization.(11) For this study, the inclusion criteria were only chosen for the under-5 years and their mom's, and suffering from diarrhea. Thus, we collected 2.359 out of 16.615 U-5 who have diarrhea in the last two weeks.

Instruments Section of 2017 IDHS Questionnaire

The IDHS's instruments consist of 4 sections, household, women's, married man's and never married man questionnaires. This study took 2 out of 4 sections of questionnaires i.e. household and woman's section questionnaires. The specific data of women's questionnaires focus on children's age and sex (*section: reproduction, instrument code number: 211*), the child had diarrhea in the last 2 weeks (*section: identification location, instrument code number: 5*) and the mother's education (*section: child health and nutrition, instrument code number: 608*). The specific data of household questionnaires contain an area of residence

(section: identification location, instrument code number: 5), latrine facilities (section: household characteristics, instrument code number: 109), and sources of drinking water (section: household characteristics, instrument code number: 101) as an access to sanitation of requirement. All open-ended items were coded once the data items of study were checked. The replies were recorded and checked, and computer-identified mistakes were excluded to continue further analysis.

Statistical Analysis

SPSS version 25 for Windows was used to enter and evaluate data. The Kolmogorov-Smirnov method was used to determine data normality in this investigation. To characterize sample characteristics, simple descriptive and Fisher's exact were utilized due to the abnormality of the data. The data analysis has a significance level of less than 0.05. The study was conducted from October to December 2022 by requesting IDHS's data survey by email to the Demographic and Health Survey Agency (IDHS data source: https://dhsprogram.com/data/dataset/Indonesia_Standard-DHS_2017.cfm?flag=0).

Result and Discussion

In table 1 from the database contains National-level data on 2359 diarrhea cases among under-5 children living in urban and rural settings. In both areas, 15% versus 18% of the U-5 are suffered from diarrhea in the last of two weeks. Diarrhea among U-5 was more common among households that used adequate drinking water sources in both areas. We could see from various source of drinking water. Most of the population used proper of source for their water, 90.5% and 58.2%, respectively. A significant difference in association is less than 0.05 between drinking water sources and the incidence of diarrhea only in the urban area. However, an unprotected wells continue to be widely used in rural, with 24.2% of families drinking from surface water. In a comparison of the two areas,

most children aged U-5 who lived in families with a proper toilet had a high rate of diarrhoea. In rural area, 18.5% was not have toilet facility, family still practices open defecation in a field/bush/river/beach. However, there were substantial variations in an association as a risk of diarrhoea in both locations (Table 1; $p=0.000$ and 0.005 , respectively).

The parent characteristics were no differences, both are in reproductive aged. Mothers were generally from less educated backgrounds, with having not completed 9 years of formal schooling. Rural regions showed 65.4% higher compare to urban, 46.4%. In contrast, the level of literacy was high, 96.7% and 91.4%, respectively. In both area, mom's education and level of literacy have significant differences ($p=0.000$) as a risk factor for diarrhea of the U-5. Mostly male of the U-5 were suffered from disease, and only in rural, sex of child was significant ($p=0.016$) become a risk factors.

The economic status of 54.4% versus 84.9% was the poorest to middle income in both areas and had a significant contribution to the disease of their U-5 (<0.001). The economic status of 54.4% versus 84.9% was the poorest to middle income in both areas and had a significant contribution to the disease of their U-5 (<0.001).

Based on the SDG 6 Global Acceleration Framework In brief report (2020), in many countries, the water and sanitation crisis is getting worse. However, it can and must be resolved. In line with Sustainable Development Goal 6 (SDG 6) – “to ensure sustainable availability and management of water and sanitation for all by 2030”. Achievement goals will support many of the other SDG's goals.(12,13) Especially, health and disease prevention, education, food, gender equality, energy, and climate change. Access to clean water and health means, families become stronger. Due to being able to save more income earned, and used for education, home-business investment, to be able to increase the level of family welfare and out of poverty.

The strategy of the WaSH's sanitation component is designed to separate people from faecal disposal. Thus, it is very important for public health and households to have a proper latrine. Insufficient WaSH has serious health and social consequences. Because Wash are critical for human growth since their absence will have health and societal consequences.(14) This study identifies the characteristics and comparisons based on the area of diarrhea prevalence among under-5 children documented based on IDHS's 2017. In both areas, there was a significant association ($p < 0.05$) between of the mom's educational background with the U-5 diarrhea.

However, since 2014 the government of Indonesia has implemented the National Community-Total-Led-Sanitation. This program aims to strengthen community empowerment efforts related to clean and healthy living (Tabel-1), preventing the environmental spread of disease, improving community capacity, and implementing government commitments to improve access to drinking water and sustainable basic sanitation.(8,15). This concept was supported and relevant with Carrad et.al study, in water, sanitation and hygiene gender equality.(16) According to Indonesia Demographic and Health Surveys (IDHS), diarrhea is still prevalent in Indonesian household in both locations. This condition is associated with WaSH condition. The findings in Table 1, around 17% of household with U-5 had diarrhea in the previous two weeks. The results highlighted the need for action to enhance sanitation and hygiene, with a focus on health as a priority. In light of the current global issue of climate change, we must pay special attention to this matter.

The CTLS national program is related to SDG's goal number 6: Clean Water and Sanitation. It is stated to ensure that the community achieves universal access to clean water and sanitation. However, countless households continue to lack proper access to WaSH, and as a result suffer from and are exposed to a variety of preventable illnesses. The study found similar consequences in multiple global citizens due to inadequate

access to WASH. It is stated that inadequate water, sanitation, and hygiene are associated with diseases such as diarrhea, protein-energy malnutrition, acute respiratory infection, soil-transmitted helminth infections, schistosomiasis, malaria, trachoma.(17) Safe water and adequate sanitation through encouraging family hygiene practices will improve the quality of life in communities. Those are needed not only to break the chain of infection transmission but also to control and eliminate the burden of neglected diseases. Better water resource management could save many lives and have direct and indirect economic advantages, from household to national economies.

Several variables based on the data (table 1), determine the occurrence of diarrhea in U-5, namely factors of the host, agents, and environment. The host factor consists of the child's characteristics (age, sex), the mother's characteristics (educational, literacy, economic status), and the environment (water sources, toilet type, type of area). In a national profile based on IDHS_2017, we could see disparities risk factors due to diarrhoea diseases among the U-5. In urban i.e source of drinking water, type of toilet facility, mom's education, literacy and economic status have contribution. Compare to rural, type of toilet facility, sex of children, mom'education, literacy and economic status. Even minor disparities in risks, yet, children in rural area with inadequate latrines and drinking water sources were 2-5 times to acquire diarrhea as a disease burden. Diseases like diarrhea, remains as the leading cause of child morbidity and death. For children's survival and development not only access to clean water source and sanitation facilities but also WaSH practices.(18) Poor practices due to faecal contamination are yet to make a major contribution. Water is one of the most fundamental human necessities, utilised for drinking, cooking, and hygiene and sanitation. Every household needs to have access to basic services such as a source of proper water including the source of safe drinking water. Further impacts due to poor hygiene, viral infection, or chemical pollution caused high mortality. Access to clean water and usage of

adequate latrines are examples of environmental issues.

Maternal education is a factor in a mother's conduct, but it is not the primary determinant of the mother's good or bad behavior in acting to reduce the incidence of U-5 diarrhea. One of the factors determining toddler discomfort was the level of the mom's or parent's literacy, not only the mother's. Generally, more greater the level of a mom's education the better of child's health. Why do mothers become a barometer?

Because women are the primary bearers of household duties, including all the responsibilities in housework and taking care of children. Also, women are primarily responsible for home water, sanitation, and hygiene management.(19) Empowering women to prevent diarrheal disease in children under-5 is crucial, along with education and access to information. The availability of clean water and good latrines as an environmental factors may reduce diarrhoea. Water pollution contains of various microorganisms, one of which is *Escherichia coli*, a bacterium that commonly causes diarrhea. Access to clean water sources and good latrines are the most basic sanitation facilities directly associated with the diseases, due to the fecal-oral route. The result was related to other studies by Pickering et al.(2019), Prakoso (2020) and Hadi (2022). (18,20,21) in several areas that reported the most diarrhea cases among the U-5 due to conditions, facilities, and use of latrines. Humans can modify the environment through individual and community activities, such as working, travelling, or leisure-time activities. As well as environmental factors, such as climate, and weather could affect human activities. Due to the public participation in daily activities, people persistently produce waste, as well as household activities.

Urbanisation often results in over-crowded and inadequate living conditions that do not meet healthy housing standards. Managing waste, including household waste, can be challenging due to improper disposal. It is important to educate families on managing household waste, being responsible, and maintaining cleanliness in

their environment. The hygiene aspect of the WaSH program focuses on implementing healthy habits in the community, which the families are not practiced, or not commonly practiced in their daily lives.(22) Changing healthy habits in a family's daily routine could save lives. For example, in the case of the current SARS-CoV-2 pandemic.

Waterborne diseases could occur when water is contaminated with a disease agent and consumed by a susceptible person, like those U-5. Providing good sanitation in the household, will reduction in diarrheal diseases, lower infection of soil-transmitted diseases, and reduce child malnutrition and stunting. Furthermore, poor sanitation leads to illness associated with work, school absenteeism, and decreased productivity. Completely, decreased disease incidence will depend on a combination of sanitation, hygiene, water, and waste management improvements besides effective behaviour change. As stated by Otsuka et al. (2019) (23) and Irianti et al. (2021) (14), slum areas of Indonesia found that in poor economic levels of households, their children have a high risk of diarrhea compared to moderate-income levels. The economic status based on this result, find out poverty rate in rural (84.9.2%) areas is higher than in urban (54.4%). This reality could be found in all Indonesian provinces.

Some studies now suggest that to enhance WaSH outcomes and promote gender equality, should incorporate stronger gender-transformative practices. The framework offers many entry points for multidisciplinary WaSH teams to include gender equality based on their capabilities and available resources. The gender transformative-WaSH attempts to address both gender and socioeconomic inequities while improving WaSH results.(24–26) Within six years to fulfil the SDGs, we must promptly examine and respond, both locally and globally, to improve SDG goal number six. Focus on addressing the root causes of the problem. A healthy lifestyle, including personal hygiene and environmental cleanliness, is essential for maintaining good family health.

Conclusion

Water is essential for maintaining a clean and healthy lifestyle. As a result, families must ensure that the water they drink fulfils their health standards. Health education will be less effective if the water satisfies the needs for everyday life that are insufficient or difficult to get.

The high morbidity of diarrhea can be reduced by including interventions within a comprehensive sanitation strategy. These initiatives include increasing access to safe drinking water, encouraging good hygiene behaviors, and creating effective waste management systems. Furthermore, the WaSH sector acknowledges the need to prioritize gender equality and social inclusion to reduce inequities. Educating people about the need for handwashing properly and providing good toilets type and enhancing collaboration with government and local partners can assist in minimizing diarrhea in Indonesia.

Acknowledgement

The authors are grateful to the Indonesia-USAID programme DHS for allowing permission to utilize Indonesian Demography and Household Survey_2017 data.

Table 1. Risk Factors Disparities of U-5 Diarrhea in Urban – Rural of Indonesia

Characteristic	Diarrhea													
	Urban						Rural							
	No		Yes		Don't know		No		Yes		Don't know			
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%		
Source of Drinking Water														
Piped into dwelling.	802	86.53	120	12.94	5	0.54	315	86.30	49	13.42	1	0.27		
Piped to yard/plot.	121	81.76	26	17.57	1	0.68	56	76.71	17	23.29	0	0		
Public tap/standpipe	81	83.51	16	16.49	0	0	34	77.27	10	22.73	0	0		
Piped-public tap/standpipe.	33	84.62	6	15.38	0	0	30	90.91	3	9.09	0	0		
Tube well or borehole	814	86.69	123	13.10	2	0.21	882	83.05	175	16.48	5	0.47		
Protected well.	794	87.06	111	12.17	7	0.77	1414	85.33	230	13.88	13	0.78		
Unprotected well.	127	79.87	31	19.50	1	0.63	596	83.71	113	15.87	3	0.42		
Protected spring	193	83.55	37	16.02	1	0.43	1126	84.09	208	15.53	5	0.37		
Unprotected spring	40	85.11	7	14.89	0	0	355	82.18	73	16.90	4	0.93		
River/dam/lake/ponds/stream/canal/irrigation	14	77.78	4	22.22	0	0	333	80.05	79	18.99	4	0.96		
Rainwater	95	87.96	13	12.04	0	0	359	86.92	48	11.62	6	1.45		
Tanker truck	34	91.89	3	8.11	0	0	74	86.05	12	13.95	0	0		
Cart with small tank	39	81.25	7	14.58	2	4.17	52	89.66	6	10.34	0	0		
Bottled water	1080	89.55	118	9.78	8	0.66	159	84.13	28	14.81	2	1.06		
Refilled water	2808	85.53	447	13.62	28	0.85	1293	84.18	239	15.56	4	0.56		
P-value			0.033						0.092					
Type of Toilet Facility														
Flush to septic tank	5769	87.42	786	11.91	44	0.67	4096	85.46	678	14.15	19	0.40		
Flush toilet : with no septic tank	526	81.93	112	17.45	4	0.62	611	81.68	134	17.91	3	0.40		
Flush toilet CS : shared/public	393	81.88	84	17.50	3	0.62	811	82.17	167	16.92	9	0.91		
Ventilated improved pit latrine (VIP)	79	86.81	11	12.09	1	1.10	433	85.07	72	14.15	4	0.79		
No facility/bush/field/river/beach/po	305	79.63	75	19.58	3	0.78	112	81.73	239	17.39	12	0.87		
Other	3	75.00	1	25.00	0	0	4	100	0	0	0	0		

Characteristic	Diarrhea											
	Urban						Rural					
	No		Yes		Don't know		No		Yes		Don't know	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
P-value	0.000						0.005					
Age of House Head (Year)												
≥20	7069	86.28	1069	13.05	55	0.67	7075	84.13	1288	15.32	47	0.56
18-19	6	100	0	0	0	0	3	60.00	2	40.00	0	0
P-Value	0.621						0.307					
Sex of Child												
Male	3605	85.63	577	13.71	28	0.67	3578	83.04	708	16.43	23	0.53
Female	3470	86.99	492	12.33	27	0.68	3500	85.24	582	14.17	24	0.58
P-value	0.183						0.016					
Age of Wife (Year)												
≥20	7069	86.28	1069	13.05	55	0.67	7075	84.13	1288	15.32	47	0.56
18-19	6	100	0	0	0	0	3	60.00	2	40.00	0	0
P-value	0.621						0.307					
Mother's Education												
No Education	26	70.27	7	18.92	4	10.81	166	81.77	32	15.76	5	2.46
Incomplete primary	247	80.19	56	18.18	5	1.62	709	83.02	134	15.69	11	1.29
Complete primary	852	84.44	151	14.97	6	0.59	1610	83.77	307	15.97	5	0.26
Incomplete secondary	1592	84.23	282	14.92	16	0.85	2014	83.88	371	15.45	16	0.67
Complete secondary	2693	86.79	391	12.60	19	0.61	1619	84.06	299	15.52	8	0.42
Higher	1665	89.90	182	9.83	5	0.27	960	86.56	147	13.26	2	0.18
P-value	0.000						0.000					

Characteristic	Diarrhea											
	Urban						Rural					
	No		Yes		Don't know		No		Yes		Don't know	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Literacy												
Cannot read at all	81	75.00	23	21.30	4	3.70	390	83.51	64	13.70	13	2.78
Able to read only parts of sentence	58	81.69	12	16.90	1	1.41	255	84.44	46	15.23	1	0.33
Able to read whole sentence	6935	86.48	1034	12.89	50	0.62	6424	84.13	1179	15.44	33	0.43
Blind/visually impaired	1	100	0	0		0	9	90.00	1	10.00	0	0
P-value	0.000						0.000					
Economic Status												
Poorest	608	79.79	144	18.90	10	1.31	3127	83.41	586	15.63	36	0.96
Poorer	1103	84.98	182	14.02	13	1.00	1633	83.15	324	16.50	7	0.36
Middle	1482	84.69	256	14.63	12	0.69	1147	85.98	185	13.87	2	0.15
Richer	1766	86.44	271	13.26	6	0.29	755	84.93	133	14.96	1	0.11
Richest	2116	90.20	216	9.21	14	0.60	416	86.85	62	12.94	1	0.21
P-value	0.000						0.001					

References

1. PERATURAN PRESIDEN NO. 18 TAHUN 2020 TENTANG Rencana Pembangunan Jangka Menengah Nasional Tahun 2020-2024 [Internet]. 2020 [cited 2024 Apr 3]. Available from: <https://jdih.bappenas.go.id/peraturan/detailperaturan/1037.%20Cited%20August%202021>
2. download.pdf [Internet]. [cited 2024 Apr 3]. Available from: <https://webapi.bps.go.id/download.php?f=aIccsykNFIUN1nrP1zbIb5SbQtuRpuPLOCt9XGejI2tieOsgZg5fMHS5sSrrFxADLkIMstizLJMtWyDQVJq6M69E4bAn466Ey9RBw1kQkSxpA3OSZ8YFZ0ZBU/VB7ki542rRaYsGLPtguiOcWTi8nuaIu9VDGUdOJvOu/4Sk19vNa64ZVoySM9MT2rysNCcOFimwQ3kKLvyq351+9ugi0XFokeYHsBFnNE5fd5YI8pw1eB6UCV/Ht7MjuP+ZtpdVsNywsOW6o4GZAYwo7brcxnWnooXNrH3Vnm1XnYUpvqtARawq2gTlonQvXM7mo>
3. Clean water, sanitation and diarrhoea in Indonesia: Effects of household and community factors [Internet]. [cited 2024 Apr 3]. Available from: <https://www.tandfonline.com/doi/epdf/10.1080/17441692.2015.1127985?needAccess=true>
4. UN-IGME-child-mortality-report-2019.pdf [Internet]. [cited 2024 Apr 3]. Available from: <https://www.unicef.org/media/60561/file/UN-IGME-child-mortality-report-2019.pdf>
5. Kahn C. Lifewater International. 2018 [cited 2024 Apr 3]. What is WASH? Discovering the Impact of Simple Practices. Available from: <https://lifewater.org/blog/what-is-wash/>
6. World Health Organization. Guidelines on sanitation and health [Internet]. Geneva: World Health Organization; 2018 [cited 2024 Apr 4]. 198 p. Available from: <https://iris.who.int/handle/10665/274939>
7. Chambers R. Going to Scale with Community-Led Total Sanitation: Reflections on Experience, Issues and Ways Forward. *IDS Pract Pap.* 2009;2009(1):01–50.
8. Indonesia KKR. STBM Kemenkes [Internet]. [cited 2024 Apr 4]. Available from: <https://stbm.kemkes.go.id/>
9. FINAL_6072023_Layout_SBS-1.pdf [Internet]. [cited 2024 Apr 4]. Available from: https://p2p.kemkes.go.id/wp-content/uploads/2023/06/FINAL_6072023_Layout_SBS-1.pdf
10. Mahrunnisa, Agussabti, Kasimin S. Analysis of the effectiveness of sustainable food house area program (KRPL) in utilization of yard land in Banda Aceh. *Russ J Agric Socio-Econ Sci.* 2019 Jan 3;85(1):153–62.
11. Indonesia Demographic and Health Survey 2017 [Internet]. Jakarta, Indonesia: BKKBN, BPS, Kemenkes, and ICF; 2017 [cited 2024 Apr 4]. Available from: <https://dhsprogram.com/pubs/pdf/FR342/FR342.pdf>
12. Global-Acceleration-Framework-Brief.pdf [Internet]. [cited 2024 Apr 4]. Available from: <https://www.unwater.org/sites/default/files/app/uploads/2021/03/Global-Acceleration-Framework-Brief.pdf>
13. The Sustainable Development Goals Report 2016.pdf [Internet]. [cited 2024 Apr 4]. Available from: <https://unstats.un.org/sdgs/report/2016/The%20Sustainable%20Development%20Goals%20Report%202016.pdf>
14. Rural–Urban Disparities in Access to Improved Sanitation in Indonesia: A Decomposition Approach [Internet]. [cited 2024 Apr 4]. Available from: <https://journals.sagepub.com/doi/epub/10.1177/21582440211029920>
15. Gaffan N, Kpozèhouen A, Dégbey C, Glèlè Ahanhanzo Y, Glèlè Kakai R, Salamon R.

- Household access to basic drinking water, sanitation and hygiene facilities: secondary analysis of data from the demographic and health survey V, 2017–2018. *BMC Public Health*. 2022 Dec;22(1):1345.
16. Carrard N, MacArthur J, Leahy C, Soeters S, Willetts J. The water, sanitation and hygiene gender equality measure (WASH-GEM): Conceptual foundations and domains of change. *Womens Stud Int Forum*. 2022 Mar 1;91:102563.
 17. Full Text [Internet]. [cited 2024 Apr 5]. Available from: <https://eprints.whiterose.ac.uk/159013/1/1-s2.0-S1438463918310484-main.pdf>
 18. Pickering AJ, Null C, Winch PJ, Mangwadu G, Arnold BF, Prendergast AJ, et al. The WASH Benefits and SHINE trials: interpretation of WASH intervention effects on linear growth and diarrhoea. *Lancet Glob Health*. 2019 Aug;7(8):e1139–46.
 19. Kayser GL, Rao N, Jose R, Raj A. Water, sanitation and hygiene: measuring gender equality and empowerment. *Bull World Health Organ*. 2019 Jun 1;97(6):438–40.
 20. Prakoso ID. CORRELATION BETWEEN ACCESS OF DRINKING WATER AND SANITATION WITH DIARRHEA INCIDENCE IN EAST JAVA. *J Berk Epidemiol*. 2020 Jan 28;8(1):42–9.
 21. Hadi S, Megatsari H. Causes of Open Defecation in East Java Province in 2018. *J Promkes Indones J Health Promot Health Educ*. 2022 Mar 23;10(1):1–7.
 22. Wolf et al. - 2022 - Effectiveness of interventions to improve drinking.pdf.
 23. Otsuka Y, Agestika L, Widyarani, Sintawardani N, Yamauchi T. Risk Factors for Undernutrition and Diarrhea Prevalence in an Urban Slum in Indonesia: Focus on Water, Sanitation, and Hygiene. *Am J Trop Med Hyg*. 2019 Mar;100(3):727–32.
 24. Willetts J, MacArthur J, Carrard N. Gender and water, sanitation, and hygiene: Three opportunities to build from recent reporting on global progress, 2000–2022. *PLOS Med*. 2023 Oct 18;20(10):e1004297.
 25. MacArthur J, Carrard N, Mott J, Raetz S, Siscawati M, Willetts J. Gender equality approaches in water, sanitation, and hygiene programs: Towards gender-transformative practice. *Front Water*. 2023 Apr 6;5:1090002.
 26. Macura B, Foggitt E, Liera C, Soto A, Orlando A, Del Duca L, et al. Systematic mapping of gender equality and social inclusion in WASH interventions: knowledge clusters and gaps. *BMJ Glob Health*. 2023 Jan 24;8(1):e010850.