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# Spatial Analysis of Children's Diarrhea in Urban Areas

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**Abstract**
Diarrhea is a condition in which an individual experiences bowel movements with a frequency of 3 times or more per day in the consistency of stool in liquid form. In addition, it can occur from person to person as a result of poor personal hygiene and environment. This research was conducted using quantitative methods and using a case series design. The population in this study amounted to 2533 toddlers with 56 samples. Data were collected using the case series method on 56 toddlers. Primary data were obtained through questionnaire interviews and recording the distribution of diarrhea incidence among toddlers with Google Maps and ArcGIS. Based on the results of the study, it was found that in the spatial analysis the incidence of toddler diarrhea was mostly spread in RW 01, as many as 36 respondents (64.3%) had a good household waste management system, as many as 41 respondents (73.2%) had a waste water management system. good, as many as 30 respondents (53.6%) had bad hand washing behavior, 37 respondents (66.1%) had poor knowledge, and as many as 37 respondents (66.1%) had higher education status. It was expected to Public Health Center to re-evaluate environmental health infrastructure recommendations.

**Keywords:** Diarrhea, Waste Water Management, Waste Management, Knowledge, Hand Washing Behavior

## 1. Introduction

Environmental health is a basic part of public health which includes all aspects of human life in relation to the environment. Environmental factors are the factors that have the greatest influence on public health status, in addition to behavioral factors, health service factors and heredity. Disease is basically the result of the interaction or relationship between human behavior and the environment, because the human environment is closely related to disease-carrying agents and can cause health problems. In developing countries like Indonesia, environmental-based diseases still dominate (Achmadi, 2011). One of the diseases that is closely related to environmental health aspects is diarrhea. Diarrhea is the loss of fluids and electrolytes by defecating in the form of watery or watery stools more than 3 times a day with or without blood or mucus. The second biggest cause of death among children under five in the world after pneumonia is diarrhea. Data from *The United Nations* Children *'s Fund* (UNICEF) and *World Health Organization* (WHO), nearly one in five deaths of children under five in the world is caused by diarrhea. The under-five mortality rate caused by diarrhea reaches 1.5 million per year. The largest incidence occurs in the first 2 years of life and decreases with the growth of the child (Ministry of Health, 2017). The results of the 2017 Indonesian Health Demography and Survey (IDHS) show the high mortality rate for children under

five in Indonesia. The child mortality rate in Indonesia in the five years before the survey was obtained, the results of the neonatal mortality rate was 15 per thousand live births, the infant mortality rate was 24 per thousand live births, and the under-five mortality rate was 32 per thousand live births. Based on the results of the survey, the high mortality rate of children under five is caused by a number of diseases, such as ARI (acute respiratory infection), high fever and diarrhea. Handling diarrhea for toddlers is the worst. Because, out of 2,328 children with diarrhea, only 74 percent of them have received treatment (Ministry of Health, 2017).

The impact of diarrhea that occurs in children under five, apart from death, is dehydration, impaired growth (failure to thrive), and is the main cause of malnutrition in children under five years of age (WHO, 2009). Risk factors that influence the incidence of diarrhea are environmental factors (clean water facilities, family toilets, density of family dwellings, waste water disposal facilities and waste treatment), maternal factors (behavior, education, knowledge) and under-five factors (exclusive breastfeeding, measles immunization and status. nutrition) as well as family factors (number of children under five in the family and socio-economic conditions) (Ministry of Health, 2017).

According to Early Research in 2013, there was a significant relationship between household wastewater treatment channels and waste management with the incidence of diarrhea in children under five. Based on the results of research conducted by Arbain in 2017, there is a relationship between mother's hand washing habits and the incidence of acute diarrhea in toddlers (Arbain, 2017).

According to Hartati & Nurazila's research in 2018 there was a relationship between maternal knowledge and the incidence of toddler diarrhea and there was also a relationship between parental education and the incidence of diarrhea in toddlers (Hartati & Nurazila, 2018). According to Nurfita's Research, in 2017 there was a relationship between exclusive breastfeeding and the incidence of toddler diarrhea (Nurfita, 2071). In addition, other studies also show that there is a relationship between the nutritional status of toddlers and the incidence of diarrhea in children under five (Irawan, 2016).

Puskemas Cipondoh is the first level Puskesmas located at jl. KH. Hasyim Ashari, Cipondoh Village, Cipondoh, Tangerang City. Puskesmas Cipondoh oversees three urban villages, namely Cipondoh, Cipondoh Makmur and Kenanga Villages. Diarrhea tends to increase every year and is one of the 10 biggest problems in the working area of Puskesmas Cipondoh, this disease attacks all age groups, especially toddlers. Diarrhea tends to increase every year and is one of the 10 biggest problems in the working area of Puskesmas Cipondoh, this disease attacks all age groups including toddlers. Data on visits of diarrhea patients among toddlers from January to April 2020 in Cipondoh Village were 57 patients, Cipondoh Makmur Village as many as 36 patients and Kenanga Village as many as 27 patients. Kelurahan Cipondoh is a village with the highest number of diarrhea cases in the Cipondoh Community Health Center Working Area. Cipondoh Village consists of 13 RW and 69 RT. The prevalence of diarrhea incidence in 2018 and 2019 was 16.85%. Diarrhea is one of the environmental-based diseases that are included in the top 10 diseases in Cipondoh Public Health Center, Tangerang City which is ranked 9th with a total of 937 cases in 2019 (Diarrhea Data from Cipondoh Puskesmas, 2019). Spatial analysis has proven important in mapping the extent of infectious diseases and assisting control policies.

## 2. Method

### *2.1 Sample Design*

The method used in this study was conducted using a quantutative approach using the *case series* study method . *A case series* is a simple descriptive report of case characteristics in a relatively short group of patients describing several patients with the same disease. Primary data in this study were obtained directly through a questionnaire with interviews and recording the spread of diarrhea incidence in children under five with the *Global Positioning System* (GPS). Secondary data in this study were obtained from the Cipondoh Public Health Center, Tangerang City. The population in this study were all toddlers (2533 toddlers ) who administratively domicile Cipondoh Village. The sample in this study were all Toddlers with diarrhea from

January to April 2020 who live in Cipondoh Village and recorded at Cipondoh health Center as many as 56 toddlers.

*2.2 Data Collection*

The instruments that will be used in the data collection process are: 1. Household Waste Management System, Assessment of Household Waste Management Systems using the observation sheet. The observation sheet consists of some questions regarding the House Waste Management System Stairs. The assessment is done by giving point 1 on questions that were answered correctly and points 0 if they were answered incorrectly. With measurement results: 0 = Not good, if you don't have a trash can or have the trash can is not closed 1 = Good, if you have a trash can and it is closed. 2. Household Wastewater Management, System Household Wastewater Management System Data is obtained through interviews with respondents using instrument in the form of a questionnaire consisting of several questions, then the assessment is done by giving point 1 on questions that were answered correctly and points 0 if answered wrong. With measurement results: 0 = Not good, if the sewerage does not have a cover and smell or have a cover and smell 1 = Good, if the sewerage has a cover and does not smell. 3. Mother's Hand Washing Habit, Data on maternal hand washing habits were obtained using questionnaire by giving some questions to find out mother's hand washing habits related to all things related to toddlers. Each score is as follows: score 5 for Very Often (SS) answers, score 4 for Frequent answers (S), score 3 for Fairly Frequent answers (CS), score 2 for Infrequent answers (TS), score 1 for Unequal answers Once (TSS). With measurement results: 0 = Not good, if the value of the respondent's answer <mean / median 1 = Good, if the value of the respondent's answer> mean / median. 4. Mother's knowledge, Maternal knowledge data obtained from data collection primary using a questionnaire measuring instrument with a number questions about prevention, causes, symptoms and risk factors diarrhea. For questions with correct answers, the score will be 1 and 0 if the answer is wrong. Knowledge categories are divided into two with measurement results: 0 = Not good, if the value of the respondent's answer <mean / median 1 = Good, if the value of the respondent's answer> mean / median 5. Mother's Education, Data related to maternal education were obtained from interviews using a questionnaire by giving 1 question for know the level of formal education taken by the mother with the measurement results: 0 = low, if not in school / graduated from elementary school / graduated Junior high school and 1 = high, if graduated from high school / college graduated.

*2.3 Data Analysis*

To determine the normality of the data, it can be done using the Kolmogorov Sminov test (sample> 30) in the statistical program for social science (SPSS). If the significance of the p-value is <0.05, the data is not normally distributed, on the contrary, if the p-value > 0.05, the data distribution is normal. In this study, there were two variables that were tested for normality, namely the knowledge variable and the mother's hand washing behavior variable. In the knowledge variable, the data is not normally distributed so that the cut of point used is Median (8) so that the respondent is said to have good knowledge if he gets a score> 8 and has poor knowledge if he gets a score <8. Whereas in the variable the mother's hand washing habits, the test results are obtained. data normality is not normally distributed with the cut of point used is Median (16.5), so the respondent is said to have a good habit of washing hands if he gets a score> 16.5 and the habit of washing hands is not good if he gets a score of <16.5.

This spatial analysis was conducted to determine the distribution of diarrhea incidence using mapping techniques in geographic information systems. Applications used in spatial analysis are open source applications or those that can be accessed openly, namely the Global Positioning System (GPS) and ArcGIS (Geographic Information System).

## 3. Results

Following are the results and discussion of spatial and univariate analysis.

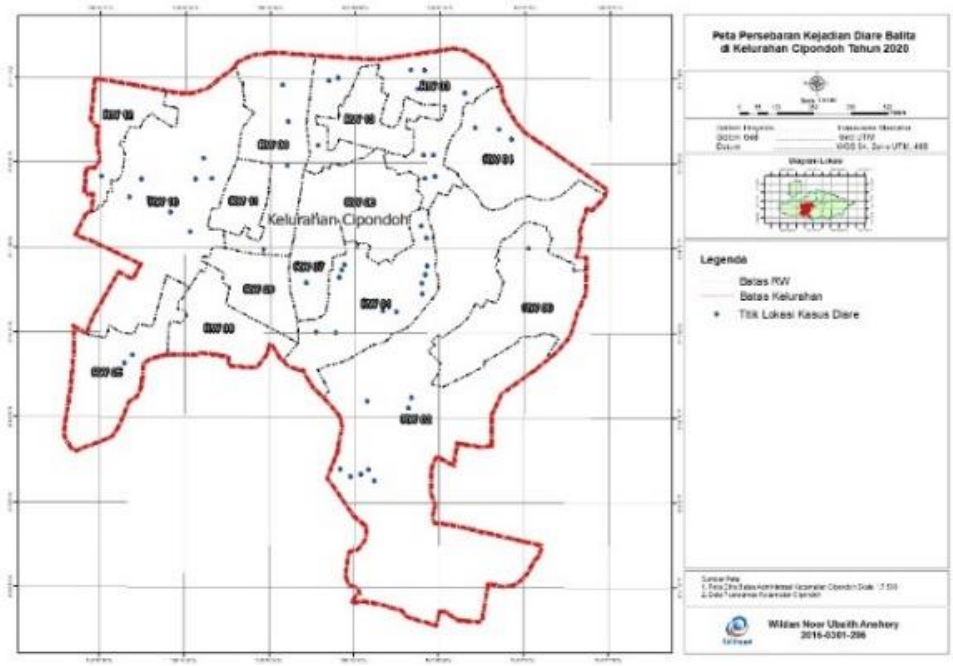


Figure 1: Description of Spatial Analysis Distribution Map of The Spread Point of Infants of Diarrhea for Toddler in Urban Areas

Based on Figure 1, it can be seen that the distribution of the spatial analysis of toddler diarrhea in Cipondoh Village with the highest cases is in the RW 01 area with a total of 13 cases (23.2%) and the areas with the lowest or clean cases of toddler diarrhea are RW 09, 11 and 13 with a number of 0 cases (0%).

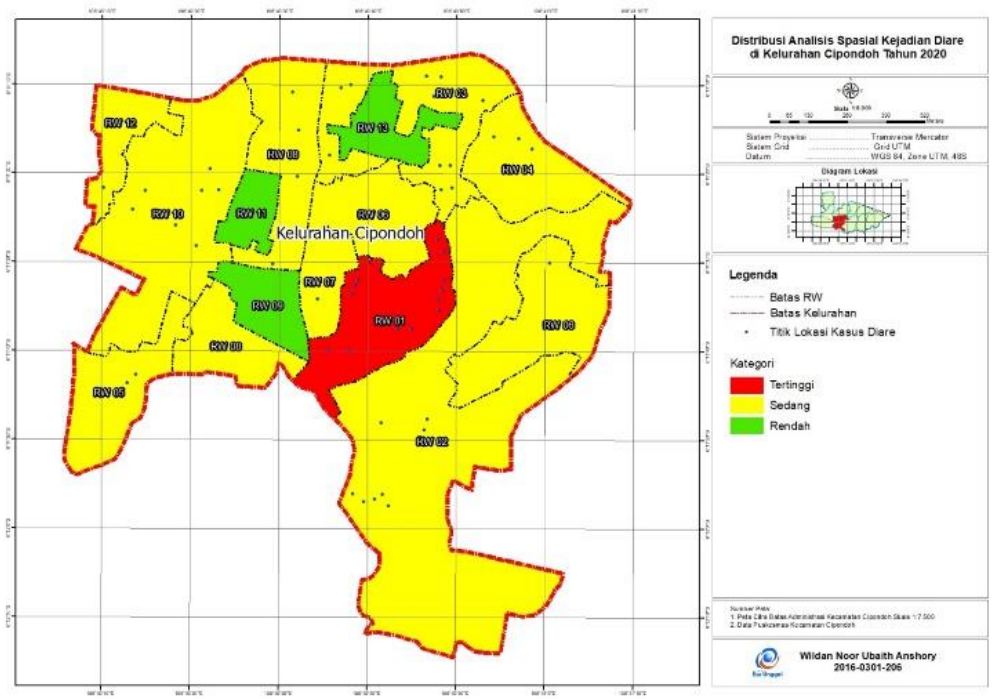


Figure 2:Description of Spatial Analysis Distribution Map of The Incidenci Rate of Diarrhea for Toddler in Urban Areas

Based on Figure 2, it can be seen that the distribution of the spatial analysis of toddler diarrhea in Cipondoh Village is categorized into three categories, namely the highest which is depicted in red, while that is described in yellow and clean which is depicted in blue. The region is categorized as the highest if there are ≤ 13 cases, moderate if there are 1 to <13 cases and clean if there are no cases of diarrhea in children under five in the region. The area with the highest category is RW 01 which is depicted in red, while the area with the cleanest category is RW 9, 11 and 13 which are depicted in green.

Table 1: Univariate Results

| Variable | Frequency | Percentage |
|---|---|---|
| **Waste management** | | |
| **Household** | | |
| Well | 36 | 64.30% |
| Not good | 20 | 35.70% |
| **Wastewater Management** | | |
| **Household** | | |
| Well | 41 | 73.20% |
| Not good | 15 | 26.80% |
| **Behavior** | | |
| **Wash your hands** | | |
| Not good | 37 | 66.10% |
| Well | 19 | 33.90% |
| **Mother's Knowledge** | | |
| Not good | 37 | 66.10% |
| Well | 19 | 33.90% |
| **Mother's Education** | | |
| High | 37 | 66.10 % |
| Low | 19 | 33.90 % |

Based on the table above , it can be seen from 56 respondents that the highest proportion is found in respondents with good household waste management as many as 36 respondents (64.3%), respondents with good household waste water management as many as 41 respondents (73.2%), respondents with poor hand washing behavior were 37 respondents (66.1% ) , respondents with poor knowledge level were 37 respondents (66.1%), and respondents with high education level were 37 respondents (66.1%).

## 4. Discussion

### *4.1. Household Waste Management*

Based on the results of questionnaires to respondents, it was found that there were more respondents with good household waste management because 36 respondents (64.3%) had a trash can equipped with a cover. Several respondents admitted that the puskesmas had several times provided health education about environmental health during health promotion at the posyandu so that the respondents were quite familiar with a good household waste management system. The puskesmas also has a sanitation clinic program where the community can carry out consultations related to sanitation problems that are not yet understood by environmental health officials to reduce the incidence of infectious diseases due to poor environmental health conditions.

### *4.2. Household Wastewater Management*

Based on the results of the questionnaire obtained, 41 respondents (73.2%) had a high frequency with good household wastewater management. Based on interviews with several respondents, respondents admitted that the

reason for good household wastewater management owned by respondents was that they obtained information or explanations about how to manage household wastewater in a simple and easy to understand way from environmental health workers from Puskesmas Cipondoh during the house data collection program. healthy. However, from the author's observations while in the field, there are still many sewerage drains on the side of the road that are open and become a gathering place for insects, especially flies, which are feared to carry disease from the sewerage of household wastewater on the side of the road to residential areas.

*4.3. Mother's Hand Washing Behavior*

Based on the results of the interview, respondents with good hand washing behavior admitted to getting knowledge about the ways and important impacts of washing hands during diarrhea treatment at the health center and during immunization at the posyandu as explained by the health center staff, while some respondents with poor hand washing behavior admitted that they often Do not have time to wash your hands with soap because the situation feels urgent when you want to do activities related to toddlers. The puskesmas has provided several facilities for washing hands that are scattered in several points in the Cipondoh Village area to facilitate and increase the culture of diligently washing hands with soap for the community. Puskesmas officers can add physical and digital educational content related to the methods and important impacts of hand washing which are then distributed through posyandu cadres physically and digitally.

*4.4. Mother's Knowledge*

Based on interviews with several health center officers, the puskesmas has several programs related to increasing maternal knowledge regarding diarrhea, including sanitation clinics, home visits for diarrhea patients, data collection on healthy homes and counseling during immunization at the posyandu. However, there are still many mothers who consider health promotion materials to be trivialized with the theme of diarrhea because they feel that diarrhea is only a minor health problem so they do not pay too much attention to the material related to health promotion at the posyandu. In connection with the new normal order of the Covid-19 health protocol, these programs are temporarily suspended and only implemented in conjunction with DHF patient visits if there are DHF cases. Aims to avoid the crowd and could cause future collection without physical distances easily controlled, resulting in the spread of viruses Covid-19. The lowest proportion of correct answers was the question about the consequences of handling diarrhea inaccurately, so it is hoped that health center officers can prepare materials and media for information to the community due to inadequate handling of diarrhea in order to increase maternal knowledge related to inappropriate handling of diarrhea.

*4.5. Mother's Education*

Based on the results of the questionnaire to the respondents, it was found that more respondents with higher education, namely SMA and Higher Education , the majority of respondents were mothers with high school graduation education. This is related to the Tangerang City government program which requires schools to be up to 12 years old by providing support in the form of education funding assistance which encourages a high proportion of the people of Cipondoh Village, Cipondoh District, Tangerang City to graduate from high school education. This study is in line with the results of the Indonesian Health Demographic Survey (Indonesian Health Demographic Survey, 2007). Based on the survey results, it was found that there was a negative relationship between the incidence of diarrhea and the level of maternal education. However, in a study conducted by (Nadia & Kusumaningtiar, 2020) that mothers with a low level of education will have a 1.94 times greater risk of diarrhea in toddlers than mothers with a high level of education.

*4.6. Overview of Spatial Analysis of the Incidence of Diarrhea for Toddlers in Urban Areas*

Based on the results of spatial analysis of data processing the incidence of diarrhea in children under five in Cipondoh Village, from 56 observation points, the most prevalent distribution of diarrhea incidence among children under five is RW 01 with 13 incidents (23.2%) and the distribution of toddler diarrhea with the lowest or clean distribution is RW 09, 11 and 13 0 incidents (0%) which can be seen in the distribution in Figure 4.1 and

illustrated significantly by the category of the division of the area with red color to categorize the areas with the highest incidence of diarrhea, yellow for wikayah with moderate categories and green for clean or low categories in Figure 4.2. Based on the WHO report, in 2017. Nearly 1.7 billion cases of diarrhea occur in children with a mortality rate of around 525,000 in children under five each year. In Indonesia based on data from the Ministry of Health. In 2017, there were 21 outbreaks of diarrhea spread across 12 provinces, 17 districts / cities. Polewali Mandar, Pohuwato, Central Lampung and Merauke districts each had 2 outbreaks. The number of sufferers was 1,725 and 34 people died (CFR 1.97%) (Ministry of Health, 2017).

Diarrhea is a condition in which an individual experiences bowel movements with a frequency of 3 times or more per day in the consistency of stool in liquid form. This is usually a symptom of a digestive tract infection. This disease can be caused by various viruses, bacteria and parasites. The infection spreads from contaminated food and drink. In addition, it can occur from person to person as a result of poor personal hygiene and environment (sanitation). Severe diarrhea causes fluid loss, and can cause death, especially in children who are malnourished or have immune disorders (Sumampouw, 2017). Diarrhea is a disease that is influenced by several risk factors. These factors are environmental factors (clean water facilities, family toilets, density of family housing, waste water disposal facilities) and waste processing), maternal factors (behavior, education, knowledge) and under-five factors (exclusive breastfeeding and nutritional status) as well as family factors (number of children under five in the family and socio-economic family) (Ministry of Health, 2017).

The impact of diarrhea on children under five, apart from death, is dehydration, impaired growth (failure to thrive), and is the main cause of malnutrition in children under five years of age (WHO, 2017). Diarrhea can have impacts such as dehydration, malnutrition and death in children under five, but until now there has been no impact from diarrhea such as dehydration or mortality in children under five in Cipondoh Village. (Daud and Anwar, 2005) explains that healthy waste water disposal facilities must meet the following requirements

1. Do not pollute clean water sources
2. Does not cause standing water
3. Does not cause odor
4. Does not create a shelter and breeding ground for mosquitoes or other insects.

From the results of data collection in the field, RW 01 is the area with the most distribution points of diarrhea cases because 10 out of 13 respondents (77%) in RW 01 have a poor household wastewater management system. This is supported by the results of the author's observations during the field where there are still many sewage drains in the RW 01 area, especially along the road which is not closed, causing puddles and becoming a place of shelter and gathering of insects such as flies, this is contrary to the theory described. by (Daud and Anwar, 2005) which states that one of the requirements for good wastewater management is that it does not create a shelter and a breeding place for mosquitoes or other insects.

Based on the results of observations from interviews with health workers, it was found that the health center had made maximum preventive, promotive, curative and rehabilitative efforts through several programs including sanitation clinics, home visits for diarrhea patients, data collection on healthy homes, monitoring of ODF (open defection Free) and sanitation inspections. . The sanitation clinic program and home visits for diarrhea patients are carried out every two weeks, data collection of healthy homes and monitoring of ODF carried out once a year and sanitation inspections every three months.

During the Covid-19 pandemic, routine programs that were carried out every two weeks and once every three months were only carried out in conjunction with DHF patient visits if there were cases of DHF. Many adjustments are being designed by the puskesmas in order to maximize existing previous programs, so that the previous existing preventive, promotive, curative and rehabilitative programs have not been implemented optimally. It is hoped that the puskesmas officers can pay more attention to handling the problem of household wastewater management in the RW 01 area which still needs to be addressed in order to reduce the spread rate.

*4.7. Description of Distribution of Household Waste Management in Urban Areas*

Based on research on 56 respondents in the Cipondoh Village, obtained the highest proportion of respondents with good household waste management as many as 36 respondents (64.3%). The results of this study are not in line with research conducted by Muhajjar (2015) which states that the proportion of waste disposal facilities that do not meet the requirements is 31 people (72.1%). Differences in research results can be influenced by environmental, economic and socio-cultural factors.

It is known that waste is a direct consequence of life, so it can be said that waste has arisen since human life. The emergence of togetherness with human activities ranging from efforts to add / take natural resources as raw materials, continue to become materials that are ready for energy, semi-finished materials for goods and service activities in consuming these goods to achieve their welfare. According to the WHO definition, waste is something that is not used, unused, disliked, or something that is thrown away from human activities and does not happen by itself (Chandra, 2014).

Waste produced by humans will rot due to the activity of microorganisms in nature, so that garbage often creates unpleasant odors so that waste must be properly managed. Waste management is an activity that is systematic, comprehensive and sustainable. The implementation of waste management includes waste reduction and handling. Reduction of waste is carried out by 3 R (Reduce, Reuse, Recycle) while handling waste is sorting, collecting, garbage to a Temporary Waste Collection (TPS) and transportation from the TPS to the Final Shelter (TPA).

Each individual is required to have a means or container for the garbage so that it does not cause odors and pollute the surrounding environment. The requirements for individual containers according to the Director General of Public Works Number 03 of 2013 are as follows:

1. Waterproof and Air
2. Easy to clean
3. Light weight and easy to lift
4. Have a lid
5. The container volume can be reused

Based on the results of questionnaires to respondents, it was found that there were more respondents with good household waste management because 36 respondents (64.3%) had a trash can equipped with a cover. Several respondents admitted that the puskesmas had several times provided health education about environmental health during health promotion at the posyandu so that the respondents were quite familiar with a good household waste management system. The puskesmas also has a sanitation clinic program where the community can carry out consultations related to sanitation problems that are not yet understood by environmental health officers to reduce the incidence of infectious diseases due to poor environmental health conditions. However, according to the author, this program has not been running optimally because not many people know about the program.

*4.8. Description of Distribution of Household Wastewater Management in Urban Areas*

Based on research on 56 respondents in Cipondoh Village, it shows that the highest frequency distribution of respondents is that of good household wastewater management as many as 41 people (73.2%). This is not in line with research by Nuraeni (2012) of 100 respondents, 62 respondents (62%) had SPAL that did not fulfill the requirements. Wastewater or wastewater is water left over from human activities, both household activities and other activities, disposed of in a form that is already dirty (polluted) and generally contains materials or substances that can be harmful to human health and disturb human health. life health (Notoatmodjo, 2007).

Wastewater from households includes feces that have the potential to contain pantogenic microbes, urine which then contains small microorganisms, and water used from kitchen, washing machine or bathroom washing. Household waste in the form of fat and soap / where fat or dirt from food scraps will break down and produce waste that smells bad due to the decomposition process. The results of the docomposition will reduce the amount of oxygen in the water and will increase BOD (biochemical oxygen demand), namely the need for oxygen to decompose organic matter in water through biochemical processes and increase the need for oxygen to decompose organic matter in water through chemical processes (Suyono and Budiman, 2010) . The bad effects of bad waste treatment include:

a) Health problems: Wastewater can contain germs that can cause water borne disease (Water borne Disease) and can contain toxic and dangerous substances, and can become a nest for disease vectors (for example flies, mosquitoes, cockroaches, etc.)

b) Decreasing Environmental Quality: Wastewater that is discharged directly into surface water (rivers and lakes) can pollute the surface, the waste water will reduce oxygen levels in the water so that it can disturb the life in it. In addition, wastewater can pollute groundwater so that the soil can no longer be used according to its purpose.

c) Beauty Distraction: Wastewater containing color pigments will cause discoloration in the receiving water body, although it is not disturbing to health, but there will be disturbance to the beauty of the water body. Sometimes the wastewater can cause an unpleasant odor.

d) Interference with Damage to Objects: Sometimes wastewater carries substances that can be converted by anaerobic bacteria into aggressive gases such as H2S, which can accelerate rusting of objects made of iron. In accordance with the substances contained in it, untreated wastewater will cause various health problems to the public and the environment, among which it will become a transmission / medium for spreading diseases, especially cholera, typus abdonminalis and bacillary dysentery, becoming a medium for breeding panthogens, becoming media for mosquito breeding or where mosquito larvae live, causing unpleasant odors and unsightly to the eye, is a source of contamination of surface water, soil and other living environments, reduces human productivity, because people work uncomfortable and others (Sarudji, 2010). Daud and Anwar (2005) explains that healthy waste water disposal facilities must meet the following requirements:

1. Do not pollute clean water sources
2. Does not cause standing water
3. Does not cause odor
4. Does not create a shelter and breeding ground for mosquitoes or other insects.

Based on the results of the questionnaire obtained, 41 respondents (73.2%) had high frequency with good household wastewater management. Based on interviews with several respondents, respondents admitted that the reason for good household wastewater management owned by respondents was because they received information or explanations about how to manage household wastewater in a simple and easy to understand way from environmental health workers from Puskesmas Cipondoh during the program. Healthy house data collection. However, from the author's observations while in the field, there are still many sewerage drains on the side of the road that are open and become a gathering place for insects, especially flies, which are feared to carry disease from roadside household sewerage to residential areas.

*4.9. Description of Distribution of Handwashing Behavior in Urban Areas*

Based on research on 56 respondents in Cipondoh Village, it shows that the highest proportion of respondents who wash their hands is not good, namely 30 respondents (53.6%). This research is not in line with research conducted by Nuraeni (2012) that the majority of respondents have a good hand washing behavior, namely 42 people (82.3%).

According to the Indonesian Ministry of Health (2007), washing hands is a very important behavior in the spread of diarrhea, because hands are a very important medium in spreading the disease through fecal oral. Not washing hands before eating or before feeding food to children, after defecating, and not washing hands before preparing food or preparing milk for children, this can increase the risk of diarrhea disease.

Washing hands with soap (CTPS) can prevent various infectious diseases that cause high morbidity and mortality of millions of children in Indonesia. CTPS behavior is a common knowledge in society, but this behavior is not carried out in a sustainable manner. This is because the facilities and infrastructure are not yet available. The advantage of the CTPS behavior is to reduce almost a proportion of cases of diarrhea and a quarter of cases of upper respiratory tract infections (ISPA), to prevent skin, eye infections and HIV / AIDS sufferers. The important time for CTPS is after defecating, after cleaning children who are defecating, before preparing the meaning, after handling animals (Ministry of Health, 2011).

Based on the results of the respondent's hand washing behavior questionnaire using the Likert scale, the most frequent respondent answered questions about washing hands using soap after defecating. Large 57 people (71.3%), wash their hands using soap, before feeding their toddlers 47 people (58.8%), wash their hands using soap with clean running water 47 people (58.8%). Based on the results of the interviews, respondents with good hand washing behavior admitted to getting knowledge about the ways and important effects of washing hands during diarrhea treatment at the health center and during immunization at the posyandu as explained by the health center staff, while some respondents with poor hand washing behavior admitted that they often Do not have time to wash your hands with soap because the situation feels urgent when you want to do activities related to toddlers. The puskesmas has provided several hand washing facilities scattered in several points in the Cipondoh Village area to facilitate and increase the culture of diligently washing hands with soap (CTPS) for the community. Puskesmas officers can add physical and digital educational content related to the methods and important impacts of washing hands which are then distributed through posyandu cadres physically and digitally.

*4.10. Description of Mother's Knowledge distribution in Urban Areas*

Based on the results of research on 56 respondents in the Cipondoh Village shows that the highest proportion obtained by respondents with less knowledge is 37 respondents (66.1%) and the proportion of respondents with good knowledge is 19 respondents (33.9%). This is not in line with research conducted of 107 respondents, there were 58 people (54.2%) with a good level of knowledge. Knowledge as something that is known to a person in any way and something that is known to people from the experience gained. Lack of knowledge or understanding of diarrhea and its handling is one factor in the increasing incidence of diarrhea in children under five. It is important to disseminate knowledge about diarrhea prevention because it is very helpful in the first treatment of children who experience diarrhea (Notoatmodjo, 2007).

Based on the results of the questionnaire, the following results were obtained: questions about the consequences of handling diarrhea inadequately (60.71%), nutritional disorders for toddler diarrhea (71.42%), good fluids for diarrhea sufferers (78.57%), condition of under-five sufferers diarrhea requiring referral (80.35%), definition Diarrhea (80.35%), causes of diarrhea (80.35%), spread of diarrhea (100%), risk factors for diarrhea (100%), and the impact of hand washing behavior (100%).

Based on interviews with several health center officers, the puskesmas has several programs related to increasing maternal knowledge regarding diarrhea, including sanitation clinics, home visits for diarrhea patients, data collection on healthy homes and counseling during immunization at the posyandu. However, there are still many mothers who consider health promotion materials to be trivial with the theme of diarrhea because they feel that diarrhea is only a minor health problem so they do not pay too much attention to the material related to health promotion at the posyandu. In connection with the new normal order of the Covid-19 health protocol, these programs are temporarily suspended and only carried out in conjunction with DHF patient visits if there are DHF cases. This aims to prevent crowds and lead to mass gathering without controlled physical distance, resulting in easy spread of the Covid-19 virus. The lowest proportion of correct answers was the question about the consequences of handling diarrhea inaccurately, so it is hoped that health center officers can prepare materials and media for education to the community due to inadequate handling of diarrhea in order to increase maternal knowledge related to inappropriate handling of diarrhea.

*4.11. Description of the Distribution of Mother's Education in Urban Areas*

Based on the results of research on 56 respondents, it shows that the highest proportion is mothers with a high level of education as many as 37 respondents (66.1%). This is in line with research conducted by Nuraeni (2012) in which 80 mothers with a high level of education were respondents (80%). According to Sander (2005) Education is a basic need, education can be obtained from formal education (basic education, secondary education and higher education) and informal education (courses, training and education and training). Education level plays an important role in public health. Low community education makes it difficult for them to be informed about the importance of personal hygiene and environmental sanitation to prevent disease infectious, including diarrhea. And it is difficult for them to receive counseling, causing them not to care about efforts to prevent infectious diseases.

Based on the results of the questionnaire to the respondents, it was found that more respondents with higher education, namely high school and university, the majority of respondents were mothers with high school graduation education. This is related to the Tangerang City government program which requires schools to be up to 12 years old by providing support in the form of education funding assistance which encourages a high proportion of the people of Cipondoh Village, Cipondoh District, Tangerang City to graduate from high school education. This study is in line with the results of the Indonesian Health Demographic Survey. Based on the survey results, it was found that there was a negative relationship between the incidence of diarrhea and the level of maternal education. However, in a study conducted by Nadia & Kusumaningtiar (2020) that mothers with a low level of education will have a 1.94 times greater risk of diarrhea in toddlers than mothers with a high level of education.

## 5. Conclusion

There are still many residents who are not familiar with the environmental health programs related to diarrhea owned by the puskesmas, one of which is the sanitation clinic, it is hoped that the puskesmas can introduce existing programs more to the community. One of the efforts that can be done is by disseminating information through posyandu cadres related to the existing program. Many mothers think that information about diarrhea is not so important as an additional job for puskesmas officer to make programs with information related to diarrhea more attractive and easier to understand, so that the message conveyed can be maximally accepted by the community. And the addition of health promotion media in the form of leaflets or physical and digital educational content distributed to the public about the importance of washing hands is felt to increase mother's awareness to pay more attention to cleanliness before carrying out activities related to toddlers

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