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Research Paper

Analysis of Household Solid Waste Generation and Composition During The Covid-19 Pandemic In Padang City, Indonesia

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Abstract
During the Covid-19 pandemic, community activities were carried out at home due to the implementation of work from home and school from home. This condition has an impact on the generation and composition of the waste produced. This study analyzes household waste's generation and composition during the Covid-19 pandemic in Padang City and compares it with conditions before the pandemic. Measurement of the generation and composition of household waste is carried out directly by respondents, and the results are sent via a questionnaire on the google form. Respondents consisted of 140 households spread across each sub-district in Padang City and were divided based on income levels, namely 83 High Income (HI) households, 50 Medium Income (MI) households, and 7 Low Income (LI) households. Measurements are carried out for eight consecutive days when the Large-Scale Social Restrictions (PSBB) are implemented. From the measurement results, it was found that household waste generation ranged from 1.38 kg/day - 2.70 kg/day, with the units of generation for HI, MI, and LI households respectively 0.587 kg/person/day, 0.387 kg/person/day and 0.256 kg/person/day. It is found that the waste generation increase doubles that of the generation before the Covid-19 pandemic when compared with the previous generation of household waste, the increase especially for HI and MI households. However, there was no significant change in the composition of waste between before and when the pandemic occurred. The composition of household waste is still dominated by food waste and plastic waste, which have increased their percentage to 68.77% and 18.07%, respectively, during the Covid-19 pandemic.

Keywords
composition, Covid-19 pandemic, household, generation, income level

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1. INTRODUCTION

Based on data from the Ministry of Environment and Forestry (KLHK) in 2019, the national waste production reached 175,000 tons per day. If accumulated in one year, Indonesia produces 64 million tonnes of waste (Ministry of Environment and Forestry, 2019). The most dominant waste source comes from households at 48%, then 24% of waste comes from traditional markets, and 9% comes from commercial areas. The rest comes from public facilities, schools, offices, roads, and others (Jaspi et al., 2015). The composition of the most produced waste is organic waste, namely food waste, and yard waste. The generation and composition of this waste are influenced by population, socio-economic level, weather, season, way of life and population mobility, and the population's number of activities (Damanhuri and Padmi, 2019).

At the beginning of 2020, the world was being hit by a covid-19 outbreak. Even since March 11, 2020, the World Health Organization (WHO) determined that the covid-19 outbreak was a pandemic, a disease whose cases increase suddenly and have spread to several countries or continents. This distribution is based on the virus's geographic distribution, which has reached 213 countries (Garcia et al., 2020). The Covid-19 pandemic has resulted in paralysis in various sectors in Indonesia. In the tourism sector and the economy, such as the decrease in foreign tourists visiting Indonesia, it also affects foreign exchange decline. Besides, it resulted in a crisis due to the economy's slowing down (McPherson and Bacow, 2015). The education sector is also affected by Covid-19 pandemic. Teaching and learning activities at schools and universities were closed. Covid-19 pandemic's impact requires the world's population to carry out social and physical distancing to cause human life changes. The community is required to do activities from home by implementing WFH (Work From Home) for workers and SFH

(School From Home) for students(Yunus and Rezki, 2020).

The City of Padang also experiences this as the capital of West Sumatra Province, with 950,187 citizens in 2019 (BPS, 2009). The Covid-19 outbreak began to emerge in Padang City at the end of March 2020. Based on data from the Padang City Health Service, until April 25, 2020, the number of infected with Covid-19 in Padang City was 61, with nine people and 13 people who died and recovered. To reduce the chain of covid-19 transmission, the Padang City Government has implemented WFH and SFH since the end of March 2020. Many community activities are carried out from home. Since April 22, 2020, the Padang City Government has implemented the PSBB (Large-Scale Social Restrictions) to prevent the expansion of the coronavirus infection. At the time of this PSBB, community activities outside the home were limited.

With so many activities carried out from home, it is estimated that it will change the generation and composition of waste generated from households. Based on Hafiz (2016), the waste generation generated from domestic sources (household) in Padang City was 2.81 liters/person/day, with the largest composition of waste being food waste 67.25% and plastic waste 16.17% (Hafizh, 2016). This data is the generation and composition of household waste in normal conditions (before the Covid-19 pandemic). This study was conducted to determine the waste generation changes and composition during the Covid-19 pandemic. This study aims to analyze the generation and composition of household waste in Padang City, which was generated during the Covid-19 pandemic, and compare the generation and composition of household waste in Padang City generated during the Covid-19 pandemic with everyday conditions (before the Covid-19 pandemic).

2. EXPERIMENTAL SECTION

The study stages consist of a literature study, primary and secondary data collection, data processing, and analysis. A literature study is related to the generation, composition of waste, and the impact of the Covid-19 pandemic. Secondary data collection includes data on the population and expenditure per capita of the City of Padang and the results of previous research on the generation and composition of household waste in Padang City.

Primary data collection in the form of measuring the generation and composition of household waste, with stages consists of:

1. Determination of the number of household samples/respondents based on SNI 19-3964-1994 concerning Methods for Collecting and Measuring Urban Waste Generation and Composition Samples. The minimum sample size for sampling at household sources for big city categories is 140 samples from the SNI table (BSN, 1994).

2. Determination of the number of samples/respondents based on income levels, namely high income (HI), medium income (MI), and low income (LI) groups. From the processing of data on expenditures per capita from BPS Padang City, the comparison of HI: MI: LI is 59.72: 35.65: 4.74 (BPS, 2009). so that the samples for HI: MI: LI are 83: 50: 7 samples respectively.

3. Distribution of questionnaire 1 about respondent data and questionnaire 2 about the household waste management

4. Selection of respondents and respondents' location, based on the level of income and distribution in the administrative area of Padang City.

5. Measurement of the generation and composition of household waste by respondents in their respective homes. Measurement of waste generation by weighing the waste produced per day. The measurement of waste composition is carried out by sorting waste based on its components such as food waste, paper waste, plastic waste, yard waste, glass waste, metal waste, and other waste. Measurement results are reported online via a google form. Measurements were made for eight consecutive days.

Data Processing and analysis carried out are:

1. Analysis of household waste generation Units of waste generation can be expressed in weight (kg/person/day, kg/p/d). From the generation calculation results for eight consecutive days carried out in this study, two data were obtained for the same day, namely the first day (q1) and the last day (q8). Analysis of the correction factor compares the average generation of the same day and the first day's generation. The equation used:

$$q = \frac{Q}{p} \tag{1}$$

$$q_{\text{average}} = \frac{(q1 + q8)}{2} \tag{2}$$

$$fk = \frac{q_{\text{average}}}{q1}$$

Where:
Q = waste generation (kg/d)
q = unit of waste generation (kg/p/d)
p = number of people
fc = correction factor
q1 = unit of waste generation first day
q8 = unit of waste generation 8th day

After obtaining the unit generation of each income level (HI. MI and LI), the average unit generation of household waste during the Covid-19 pandemic is calculated using the following formula [9] :

$$q_{\text{average}} = \frac{(qH1 + qM1 + qL1)}{3} \tag{3}$$

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2. Analysis of the composition of household solid waste Use the following equation (BSN, 1994) :

$$\%composition = \frac{w}{W} x100\% \quad (4)$$

Where:
w = weight of solid waste component (kg)
W = weight of total household solid waste

Comparing the generation and composition of household waste during the Covid-19 pandemic with everyday conditions (no pandemic) was done by making a comparison chart between the two data. From this graph, it can be seen that changes have occurred, such as an increase or decrease in the amount and type of waste generated by households in Padang City.

The data of waste generation and composition for before the Covid-19 pandemic is from the 2016 Hafiz research because this data is the latest data for measuring the generation and composition of waste from domestic sources in Padang City. This data can still be used because it is still within five years. According to SNI 19-3964-1994, data on the measurement of waste generation and composition should be repeated every five years (BSN, 1994). For the data on waste generation and composition to be compared with this research, the results of Hafiz's 2016 research data are calculated for 2020, as shown in Table 1.

Table 1. Domestic solid waste generation in Padang City before the Covid-19 pandemic

Source	Waste Generation (kg/p/d)	
	2016*	2020
High Income (HI)	0.226	0.235
Middle Income (MI)	0.186	0.194
Low Income (LI)	0.193	0.201
Average	0.201	0.21

Source: * (Hafizh, 2016)

3. RESULTS AND DISCUSSION

3.1 Respondent Identity Data

Respondent identity data is obtained from questionnaire 1, the result of the preliminary survey. Questionnaire 1 data processing is used for household grouping based on income and household location selection.

3.1.1 Income level

From BPS data for, the ratio of HI: MI: LI was 59.72%: 35.65%: 4.74%. HI class households have a monthly income of > Rp. 5,000,000 -, MI class households are Rp. 2,500,000 - Rp. 4,999,999 -, and the LI class household of Rp. 750,000 - Rp. 2,499,999 -. Figure 1a shows the income level of the respondents. From this figure, it can be seen that most respondents in this study were households with a high income level (HI), amounting to 59.72%.

3.1.2 Location of residence

Filling out the questionnaire via google form media was distributed to 11 sub-districts in Padang City. Respondents came from Padang Utara, West Padang, East Padang, South Padang, Koto Tangah, Kuranji, Lubuk Begalung, Nanggalo, Pauh, Lubuk Kilangan, and Bungus Districts. Most respondents were in Koto Tangah District at 15%, while the least respondents were in South Padang District at 3.57%. The distribution of respondents' residences can be seen in Figure 1b.

3.1.3 Age of respondent

The respondents' age range is categorized into five according to population data from BPS Padang City, namely, 20 years and under, 21-30 years, 31-40 years, 41-50 years, and more than 50 years. The highest percentage of age was in the age range of 41-50 years at 61%. Figure 1c shows the age of the respondent.

3.1.4 Number of family members

The number of family members in the household ranges from two to ten people. The highest number of family members was five people at 34.28% and the next four people at 32.14%. Figure 1d shows the number of family members of the respondent.

3.1.5 Educational background

The questionnaire processing results found that the most recent respondents' most recent education was Diploma/bachelor graduates by 49.30%. Next are high school graduates with an equivalent of 23.59%. Respondents with the last education of Masters / Doctorate were 17.87%, and the least were respondents with the latest junior high school education equivalent of 9.24%. The respondent's latest education is shown in Figure 1e.

3.1.6 Occupation

Most respondents' occupation is Civil Servants at 41.43%. Next are entrepreneurs, retirees, private companies, farmers, Army/Police at 20%, 9.28%, 8.57%, 7.86%, and 12.86%. Figure 1f shows the type of work of the respondent.

3.1.7 Type of house

Based on the grouping of houses, it was found that respondents with permanent houses were 84.28%, semi-permanent houses were 13.57%, and non-permanent houses were 2.14%. Respondent's house type is shown in Figure 1g.

3.1.8 The area of the house

According to data from housing developers/ developers, the house area is categorized into five, namely, < 45 m^2, 46 - 54 m^2, 55-70 m^2, 71-120 m^2, and > 120 m^2. Houses in the area of 71 - 120 m^2 dominate the respondents' answers,

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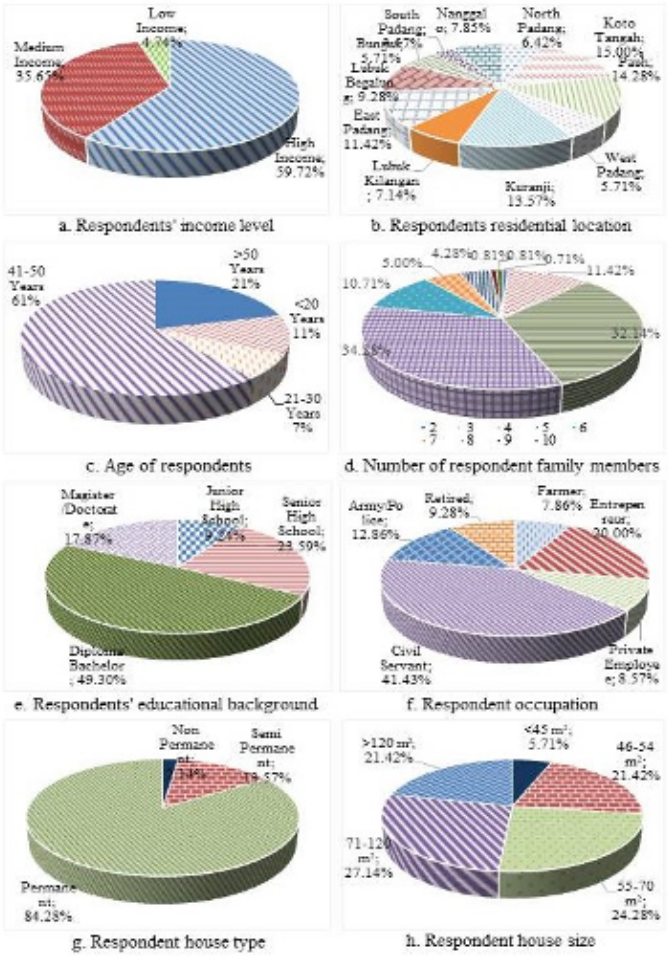

Figure 1. Respondent Identity Data

amounting to 27.14%. Figure 1h shows the area of the respondent's house.

Based on the results of questionnaire 1 processing, it was found that the respondents in this study were mostly households with the high income group (HI) who had permanent houses with a house area ranging from 71 to 120 m^2. Most respondents' occupations are civil servants (PNS) with the latest education completing a diploma/bachelor's degree. The average number of members in the family is five people.

3.2 Household Waste Management During the Covid-19 Pandemic

In Padang City, the Covid-19 outbreak has been detected since April 25, 2020. To reduce the transmission of Covid-19, the Padang City Government has implemented the Large-Scale Social Restriction (PSBB) by implementing WFH and SFH activities. This enforcement resulted in many community activities being carried out in households. This situation will have an impact on the generated waste generation. From the questionnaire data, it was found that 98%

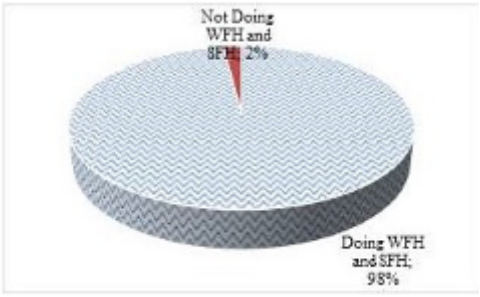

Figure 2. Enforcement of WFH and SFH

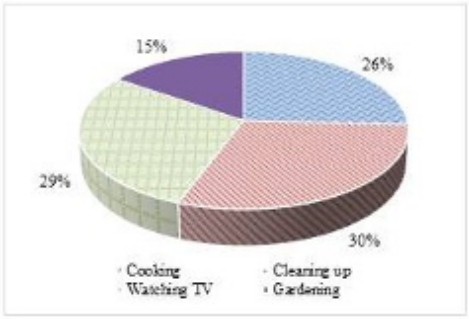

Figure 3. Activities during WFH / SFH

of respondents did WFH / SFH in their respective homes, and only 2% still had activities outside the home, as shown in Figure 2.

The activity of cleaning the house was the activity most often carried out by respondents during the implementation of WFH / SFH with 30% of respondents, then watching TV by 29% of respondents, cooking 26% of respondents, and gardening 15% of respondents. Activities during WFH / SFH are shown in Figure 3.

Questionnaire 2 also asked whether the respondents experienced changes in waste management during the Covid-19 pandemic associated with the implementation of WFH / SFH. About 14.45% of HI respondents and 10% of MI respondents stated changes to waste management during the Covid-19 pandemic. However, none of the LI group respondents felt a change in waste management during the Covid-19 pandemic. This fact is shown in Figure 4. The difference in waste management experienced by some HI and MI class households can be seen in reducing activities. Before the Covid-19 pandemic, respondents chose to use containers repeatedly, while during the Covid-19 pandemic, respondents preferred buying goods in large packages. This option is one way for respondents to fulfill their daily needs in restricting their activities outside the home. Differences in waste management can also be seen in waste processing activities, namely an increase in households' composting activities during the Covid-19 pandemic.

The Covid-19 pandemic can, directly and indirectly, affect the environment In Iran, the use of PPE, such as face

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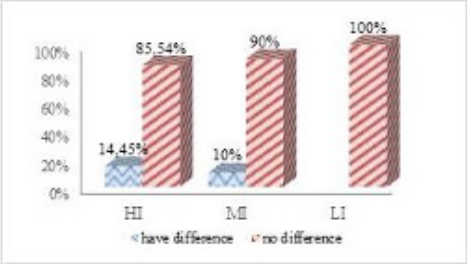

Figure 4. Differences in waste management before and during Covid-19

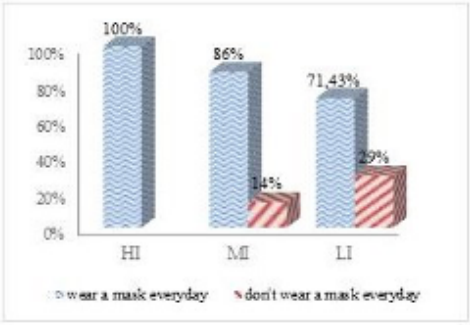

Figure 5. Use of masks

masks, has been recommended by INHMC (Iran's National Headquarters for Managing Coronavirus) for everyone. Most of this PPE has been used by the public every day during the Covid-19 Pandemic. The average use of disposable plastic masks and gloves in the City of Tehran during the Covid-19 Pandemic was 5.56 million and 11.13 million from March to May 2020, respectively (Zambrano-Monserrate et al., 2020).

The use of masks during the Covid-19 pandemic also occurred in Padang City. Based on questionnaire 2, it was found that 100% of HI class households, 86% of the MI class, and 71.43% of the LI group answered using masks during the Covid-19 pandemic seen in Figure 5. The difference in the use of these masks is influenced by education level and income level. People with low levels of education do not understand the impact of the Covid-19 pandemic on health and the environment, so they do not anticipate the spread of this outbreak by wearing masks. Likewise, with limited income, they do not have the funds to provide masks.

Figure 6 shows the management of masks in the household. 75.9% of HI class households immediately throw away and mix mask waste with other garbage, 6.02% of respondents throw mask trash into special containers, and 18.07% of respondents cut their masks first. It was found that 86% of HI respondents dispose and mix mask waste with other garbage for MI class households, and 14% of respondents cut their masks first. For LI class households, 100% of respondents throw away and mix mask waste with other garbage.

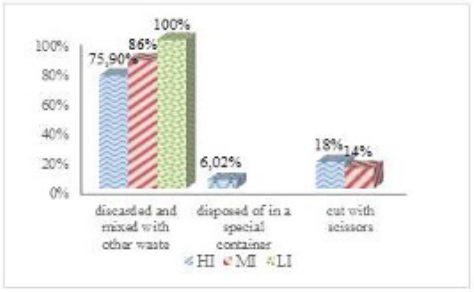

Figure 6. Mask waste management

From the picture, it is found that public knowledge of the dangers of mask waste is still minimal. This condition is evidenced by the high percentage of respondents in each household group who immediately throw away the mask trash without cutting it first and mix it with other trash. The used masks should not be thrown away carelessly. According to a circular issued by the Ministry of Environment and Forestry during the Covid-19 pandemic, disposable masks that are to be discarded must be sprayed first using a disinfectant, then clipping the masks so that they are not misused (MENLHK, 2020).

3.3 Analysis of Waste Generation During the Covid-19 Pandemic

From the measurement results of waste generation during the Covid-19 pandemic, it was found that HI class households produced an average waste generation of 2.7 kg/day. For the MI group, it was 1.76 kg/day, and for the LI group, it was 1.39 kg/day. The HI class households produce the highest quantity of waste during the Covid-19 pandemic. This fact due to the high HI lifestyle, such as buying food and beverages. The level of one's income influences a high lifestyle. The higher the people's lifestyle, the higher the waste produced. Figure 7 shows the daily generation of household waste in Padang City during the Covid-19 pandemic.

During the Covid-19 pandemic, household waste was mostly generated on weekends, namely on Saturdays and Sundays for all household income levels. Even though the community tends to be at home during the pandemic, on weekdays, they still carry out WFH / SFH. At the end of the week, people generally take a break from work and school routines, so they do more other activities such as cooking and cleaning the yard, increasing waste generation.

The unit value of generation is obtained by dividing the waste generation data by the number of family members. Based on the questionnaire data, the average family member in the household is five people. From the calculation, it is obtained that the unit of waste generation for HI class households is 0.578 kg/p/d, the MI group is 0.378 kg/p/d, and the LI group is 0.256 kg/p/d. The value of the generation unit for the LI group is smaller than the HI and MI

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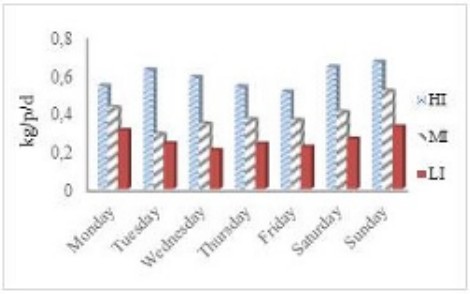

Figure 7. Daily household waste generation during the Covid-19 pandemic

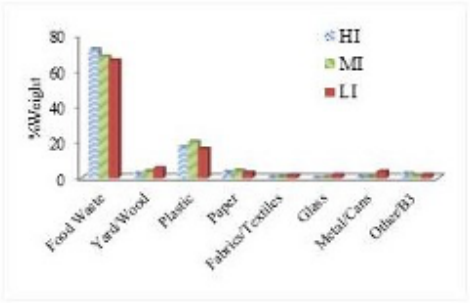

Figure 8. Composition of household waste during Covid-19

groups. This fact is influenced by simple life habits and a relatively small income. Generally, the LI group only meets the primary needs in daily life.

3.4 Composition of Household Waste During the Covid-19 Pandemic

Based on the measurement results of household waste composition during the Covid-19 pandemic in Padang City, it was found that the most massive composition of waste was an organic waste at 93.12%, while inorganic waste was 6.87%. The composition of Padang City household waste during Covid-19 can be seen in Figure 8.

The biggest components of waste in HI class households are food waste and paper waste. The high composition of HI class household food waste is related to HI class households' activities during the Covid-19 pandemic, which mostly carried out cooking activities at home because most restaurants or restaurants were closed during the PSBB period. For paper waste, it is obtained from learning activities, school assignments, and office activities during WFH / SFH.

The most prominent components of waste in MI class households are plastic waste and yard/wood waste. From this study, it was found that MI class households produced plastic waste by 20.42%. The high percentage of plastic waste was due to the prevalence of online ordering activities during the implementation of PSBB, where the plastic was used as packaging for online groceries. More yard waste during the Covid-19 pandemic was influenced by increased gardening activities or cleaning the yard because people had

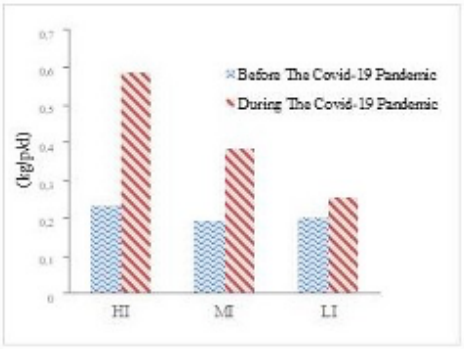

Figure 9. Comparison of household waste generation units before and during the Covid-19 pandemic

more time for home activities.

he biggest waste component for LI class households is glass waste, metal waste/cans, and other waste / B3. The existence of glass and metal waste/cans in LI's household waste is due to low awareness of waste reduction activities at the source. There is still much inorganic waste that is immediately disposed of without carrying out 3R activities first.

3.5 Comparison of the Generation and Composition of Waste Before and During the Covid-19 Pandemic

Comparison of the generation of waste generated by households during the Covid-19 pandemic and before the Covid-19 pandemic was carried out by comparing the results of this study with Hafiz's 2016 research results projected to 2020. Figure 9 shows a comparison of the household waste generation before and during the Covid pandemic. -19.

Figure 10 shows there are differences in the generation of household waste before and during the Covid-19 pandemic. Waste generation during the Covid-19 pandemic has increased quite significantly for HI and MI households. The household waste generation unit for the HI class increased from 0.235 kg/p/d to 0.587 kg/p/d, and the MI class household waste generation increased from 0.194 kg/p/d to 0.387 kg/p/d. However, for LI households, there was only a slight increase in the generation, from 0.201 kg/p/d to 0.256 kg/p/d. The increase in the generation of household waste during the Covid-19 pandemic for each of HI, MI, and LI's income levels was almost double the amount of waste generated before the Covid-19 pandemic. The average generation of household waste before Covid-19 was 0.979 kg/p/d, increasing to 1,949 kg/p/d during the Covid-19 pandemic. An increase in household waste generation during the Covid-19 pandemic has also occurred in several cities in Indonesia. Several mass media reported an increase in waste generation during the Covid-19 pandemic, namely in the City of Semarang, Central Java. Based on data from the Indonesian Environmental Scientist Association (IESA), the

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sharp increase in Indonesia's waste generation occurred from March to May 2020, which was 70% compared to before the Covid-19 pandemic (Republika.co.id, 2020).

Several cities in other countries have also experienced Covid-19 pandemic's impact on the increase in waste generation. Research conducted in Kheniffra City, Morocco, found an increase in household waste by 3.8% (Ouhsine et al., 2020). An increase in the generation of household waste during the Covid-19 pandemic also occurred in the United States. The national household waste generation in the United States increased by 20% from a typical day (before the Covid-19 pandemic). Some locations in the United States have even experienced an increase of up to 30% (Parhami, 2020). Household waste in New York City during March increased by 3.3%. Another country that has experienced an increase in waste generation is in Thailand. Bangkok, which jumped to 62% in April (CNN, 2020). In Iran, precisely in the City of Tehran, the Covid-19 pandemic has changed the quantity and composition of waste. The average unit of waste generated during the Covid-19 pandemic was 0.745 kg/p/d, with the highest generation reaching up to 1-1.2 kg/p/d. The amount of waste in the City of Tehran has increased to 7,500 tonnes/d (Daryabeigi and Vaezi, 2020).

This increase in waste generation is influenced by the number of activities that respondents carried out in households during the Covid-19 pandemic. The implementation of WFH and SFH requires people to move from home and spend time at home. As many as 98% of respondents applied WFH and SFH in their respective homes from the questionnaire. The same thing was also obtained from (Zambrano-Monserrate et al., 2020), in China, the USA, Italy, and Spain. The shift from work to the home directly forces the entry of various risk factors for increasing the amount of waste in the family environment. The instant consumptive pattern is the primary driver in the increase in the amount of waste in houses, apartments, and various areas within the individual sphere. Another study states that increasing the amount of time duration at a location will increase the amount of waste generated (Wardiha et al., 2014). Besides, during the implementation of the PSBB, the people of Padang City tend to shop online. This reason is also following the research results by Mourad, which states that quarantine in most countries has encouraged consumers to shop online from home. As a result, the waste generation generated by households tends to increase(Mourad, 2016).

In addition to the increasing activity at home, the composition of waste also affects the weight of waste produced. From the measurement of the composition of household waste during the Covid-19 pandemic, it was found that there was an increase in the composition of food waste, yard/wood, and metal / can waste with a value of 68.77%, 3.29%, and 1.69% respectively. Food waste, yard waste, and metal/cans waste have a higher density than other waste components. The density of waste affects waste weight. When the density is higher, the weight is greater, and the volume will be smaller. Each solid waste type is 0.29 kg / l for food waste, 0.10 kg / l for yard waste, and 0.32 for metal/cans (Tchobanoglous et al., 1993). Furthermore, according to Raharjo's research Raharjo (2015), the most considerable water content is obtained in food waste, amounting to 52.28%. The water content will also affect the weight of the waste (Raharjo, 2015).

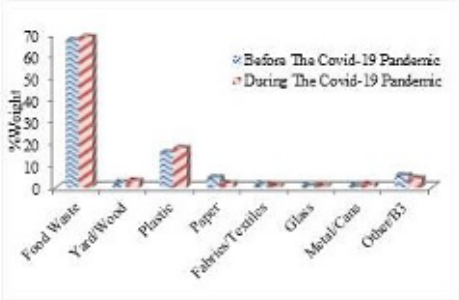

Figure 10. Comparison of household waste composition before and during the Covid-19 pandemic

The composition of household waste before and during the Covid-19 pandemic shows no significant change, as seen in Figure 10. The largest composition of waste for each income level is food waste and plastic waste. During the Covid-19 pandemic, the percentage of food waste and plastic waste increased by 2-3%. Food waste increased from 64% -70% before the Covid-19 pandemic to 65% -72% during the Covid-19 pandemic. Another study in New York City found that organic waste during the Covid-19 pandemic also increased from the previous year, which was 13.3% (Staub, 2020).

The plastic waste generated by households before the Covid-19 pandemic ranged from 14-17%, and during the Covid-19 pandemic increased to 16-20%. The increase in the amount of plastic waste in households is due to changing shopping trends during the PSBB, such as the rampant ordering of goods on online media, mostly plastic coated as packaging. Quarantine policies in most countries have encouraged consumers to shop online from home. Products purchased online are shipped in plastic packaging, increasing the amount of plastic waste (Mourad, 2016). Research conducted by Ouhsine et al. (2020) also stated that one of the effects of the Covid-19 pandemic was the growing trend of shopping through online ordering (Ouhsine et al., 2020). The increase in the composition of plastic waste has also occurred in almost all countries. Data released by the Italian National Consortium said the increase in online shopping led to an 8% increase in plastic waste. Plastic waste in New York in March 2020 increased by 11.7% (Staub, 2020). Research by Klemes et al. (2020) estimates an increase in household plastic waste components by up to 4% (January, 2020).

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Apart from food waste and plastic waste, the composition of other waste / B3 is also high, with the generation per household of 0.086 kg/day. This number is influenced by the increased use of personal medical devices and public awareness of the dangers of Covid-19. According to Shi and Zeng, Indonesia ranks second as the city with the largest contributor to medical waste after the Philippines with an additional 212 tons/day of medical waste (Jiangtao and Zheng, 2020). Other waste / B3 that was mostly found during the Covid-19 pandemic was in the form of used batteries and lamps, disposable masks, tissue, cleaning bottles, and latex gloves. Meanwhile, in the conditions before the Covid-19 pandemic, the most hazardous waste found from households was body care 37% and cleaning products 24% (Ruslinda et al., 2006). According to Duan and Xiao (2020) research, significant changes are seen in the consumption of hygiene products such as disinfectants and cleaning products, whose consumption percentage increases during the lockdown period due to panic caused by the spread of the Coronavirus. The effects of the Covid-19 pandemic are not limited to physical health but also impact each individual (Chen et al. (2020);Xiao (2020)). The implementation of lockdowns can affect residents' lifestyle and socio-economic context as a result of the panic and psychological effects of lockdown (Xiao (2020);Chen et al. (2020))

This study found a decrease in the percentage of paper waste for all household income levels. Respondents' activities influenced this decrease during WFH and SFH, carried out using the online system. All forms of tasks or work are carried out online, such as sending files and photos via internet access, so that the production of paper waste is reduced during the Covid-19 pandemic. Another study conducted by Ouhsine et al. (2020) in Central Morocco, to be precise in the City of Khenifra and Tighassaline, found no paper waste produced in the city during the Covid-19 pandemic (Ouhsine et al., 2020)

4. CONCLUSIONS

During the Covid-19 pandemic, household waste generation in Padang City almost doubled from pre-pandemic levels. Waste generation for HI, MI and LI households is 0.587 kg/p/d, 0.387 kg/p/d and 0.256 kg/p/d, respectively. However, the composition of waste has not changed. The composition of most waste is still dominated by food waste and plastic waste, whose numbers have increased compared to before the pandemic, with a composition of 68.77% and 18.07%, respectively.

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