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Introduction

Access to adequate and hygienic sanitation facilities, also known as improved sanitation facilities (ISF) are essential for achieving optimal health.¹⁻⁴ Unimproved sanitation facilities (USF) can be detrimental to health as they need to meet basic hygiene and privacy standards.^{1,4} This study seeks to determine USF users' prevalence in Malaysia and to identify its sociodemographic determinants.

Materials and Methodologies

This study analysed the secondary data from the Housing and Environment Section of the National Health and Morbidity Survey (NHMS) 2020: Communicable Diseases, conducted nationwide between August to October 2020, using a multistage, stratified random sampling technique.⁵ A total of 5,364 respondents were successfully interviewed for this section, but for the purpose of synchronizing the finding based on the occupational group, only those who're aged 15 years old and above were included in this study (N=4,207).⁵ Complex sample analysis and multiple logistic regression (MLR) analysis were utilised to determine the prevalence of USF users and its determinants.

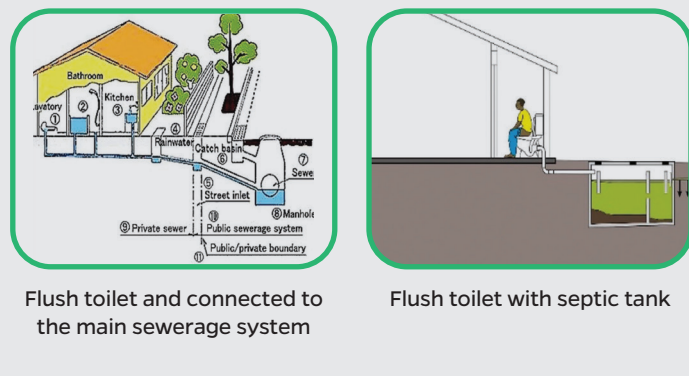
Results

The category of ISF and USF and their type of sanitation facilities respectively were graphically shown in Figure 1. Among the respondents, 109 out of 4,207 respondents (2.6%) were identified as those using USF with the significantly highest percentage by each sociodemographic variable were West Malaysia (Peninsular Malaysia) (70.6%), Malay (72.0%), Malaysian (93.5%), secondary level of education (47.7%), private servants and self-employed (47.1%) and B40 monthly household income status (69.1%) (Table 1).

The prevalence of USF among household members (age ≥ 15) in Malaysia was 3.4% [95% confident interval (CI): 0.70, 15.00], representing about nearly a million people, where the significantly highest prevalence was found in urban area of East Malaysia (19.1%), age group of 15-24 (6.4%), Bumiputera Sabah and other ethnicities (17.6% & 17.7%, respectively), permanent residents & non-Malaysian (18.6%) and without formal education background (30.6%) (Table 2).

USF was significantly associated ($p < 0.05$) with East Malaysia [urban = adjusted odd ratio (AOR): 31.4 (95% CI: 6.82, 144.55); rural = AOR: 5.6 (95% CI: 1.18, 26.27)]; permanent residents and non-Malaysian [AOR: 2.8 (95% CI: 1.10, 7.16)]; no formal and primary education backgrounds [AOR: 15.4 (95% CI: 5.74, 41.59) vs. AOR: 8.0 (95% CI: 3.11, 20.61)]. Malay and Bumiputera Sarawak were significantly protective factors with AOR: 0.2 (95% CI: 0.06, 0.84) and AOR: 0.1 (95% CI: 0.03, 0.51), respectively (Table 3).

Improved Sanitation Facilities (ISF)



Unimproved Sanitation Facilities (USF)

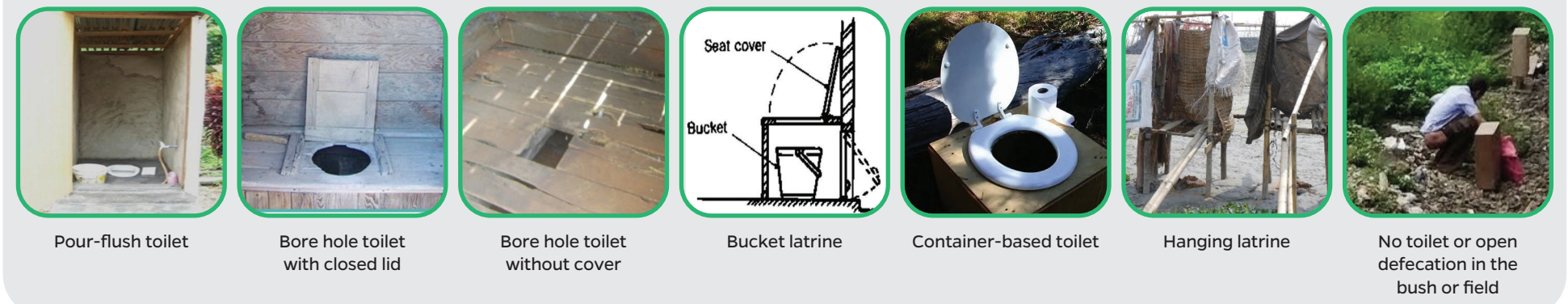


Figure 1 - Graphical explanation about the category (either ISF or USF) and their type of sanitation facilities, respectively.⁵

Discussion

Access to IFS is a crucial factor for a country's sustainable growth and development,³⁻⁴ and this study shows that it is available to almost all household members in Malaysia. USF were more likely higher in East Malaysia (Sarawak, Sabah and FT of Labuan) in both urban and rural areas as compared to urban area of Peninsular Malaysia, in those with lower educational backgrounds as compared to tertiary educational background and among permanent residents and non-Malaysia as compared to Malaysian itself. Although Kong (2020) analysed the WASH indicators in Malaysia based on living quarters (LQs) instead of household members as in this study, the condition of sanitation facilities and its determinants in Malaysia for this current study were quite similar as compared to the study in 2015 especially regarding directly to the educational background and indirectly to the region-strata and citizenship variables.⁶ In this study, Malay and Bumiputera Sarawak were found to be significantly protected determinants as compared to other ethnicities, while rural area of Peninsular Malaysia, Bumiputera Sabah, Orang Asli and secondary level of educational background were found to be insignificant determinants.

Conclusion

Generally, more than 95% of the household members (age ≥ 15) in Malaysia were using improved sanitation facilities in 2020 where this is in line with the targeted sustainable development goals (SDGs)⁷⁻⁸ in 2030.⁸ More funding aid and monetary subsidies needs to be channelled to the health departments and municipalities as well as rural development boards in Sabah, Sarawak and FT of Labuan, as well as the enhancement in health promotion and encouraging behavioural changes toward the use and need of IFS among permanent residents, non-Malaysian and those with lower educational background should be done to ensure Malaysia can fulfil the SDG 6 requirement by 2030.

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REFERENCES

- Deshpande A, Miller-Petrie MK, Lindstedt PA, Baumann MM, Johnson KB, Blacker BF, Abbastabar H, Abd-Allah F, Abdelalim A, Abdollahpour I, Abegaz KH. Mapping geographical inequalities in access to drinking water and sanitation facilities in low-income and middle-income countries, 2000-17. *The Lancet Global Health*. 2020 Sep 1;8(9):e1162-85.
- Howard G. The future of water and sanitation: global challenges and the need for greater ambition. *AQUA—Water Infrastructure, Ecosystems and Society*. 2021 Jun 1;7(04):438-48.
- Ritchie H, Roser M. Clean water and sanitation. *Our World in data*. 2021 Jul 1.
- World Health Organization. Water, sanitation, hygiene and health: a primer for health professionals. World Health Organization; 2019.
- Institute for Public Health (IPH) 2021. National Health and Morbidity Survey (NHMS) 2020: Communicable Diseases. Volume 1. 2020. 280 pages.
- Kong YL, Anis-Syakira J, Fun WH, Balqis-Ali NZ, Shakirah MS, Sararak S. Socio-economic factors related to drinking water source and sanitation in Malaysia. *International Journal of Environmental Research and Public Health*. 2020 Nov;17(21):7933.
- Bain R, Johnston R, Mitis F, Chatterley C, Slaymaker T. Establishing sustainable development goal baselines for household drinking water, sanitation and hygiene services. *Water*. 2018 Nov 23;10(12):1711.
- Mara D, Evans B. The sanitation and hygiene targets of the sustainable development goals: scope and challenges. *Journal of Water, Sanitation and Hygiene for Development*. 2018 Mar 1;8(1):1-6.

Table 1 - Sample characteristics of the respondents (age ≥ 15) (N=4,207)

Variables	n	%
Improved sanitation facilities	4,098	97.4
Unimproved sanitation facilities	109	2.6
Region - Strata		
West Malaysia - Urban	1696	40.3
West Malaysia - Rural	1273	30.3
East Malaysia - Urban	580	13.8
East Malaysia - Rural	658	15.6
Age group		
15-24	890	21.2
25-34	822	19.5
35-44	772	18.4
45-54	651	15.5
55-64	611	14.5
65+	461	11.0
Gender		
Male	1,975	46.9
Female	2,232	53.1
Ethnicities		
Malay	2,586	72.0
Bumiputera Sabah	417	11.6
Bumiputera Sarawak	305	8.5
Orang Asli	32	0.9
Others	250	7.0
Citizenship		
Malaysian	3,935	93.5
Permanent Residents & Non-Malaysian	272	6.5
Education background		
No formal education	243	5.8
Primary level	897	21.5
Secondary level	1,992	47.7
Tertiary level	1,044	25.0
Occupational background		
Private servant and self-employed	1,798	47.1
Unpaid worker	812	21.3
Student	460	12
Currently not working	748	19.6
Household monthly income category		
B40	2,739	69.1
M40 & T20	1,224	30.9

Table 2 - Prevalence of USF users by sociodemographic characteristics in Malaysia, 2020

Variables	n	Estimated Population (%)	Prevalence (%)	95%CI Lower	95%CI Upper
Overall (USF)	109	843,753	3.4	0.70	15.00
Region - Strata					
West Malaysia - Urban	2	6,610	0.0	0.00	0.20
West Malaysia - Rural	4	9,100	0.3	0.10	1.00
East Malaysia - Urban	69	666,795	19.1	2.80	66.00
East Malaysia - Rural	34	161,247	7.8	1.90	27.10
Age group					
15-24	36	366,672	6.4	1.20	27.60
25-34	25	245,136	3.9	0.70	18.40
35-44	13	68,829	1.5	0.30	7.40
45-54	17	78,219	2.4	0.60	9.60
55-64	11	47,800	1.7	0.40	7.30
65+	7	37,097	1.6	0.40	6.20
Gender					
Male	46	377,661	2.9	0.60	14.20
Female	63	466,092	3.8	0.80	15.90
Ethnicities					
Malay	5	12,795	0.1	0.00	0.30
Bumiputera Sabah	62	326,849	17.6	3.80	53.70
Bumiputera Sarawak	4	7,934	0.9	0.20	3.30
Orang Asli	2	5,167	3.5	1.60	7.40
Others	36	491,008	17.7	3.60	55.60
Citizenship					
Malaysian	65	324,020	1.5	0.30	7.00
Permanent Residents & Non-Malaysian	44	519,733	18.6	4.10	54.80
Education background					
No formal education	41	424,087	30.6	6.80	72.80
Primary level	41	285,809	5.9	1.30	22.20
Secondary level	21	103,853	0.9	0.20	3.70
Tertiary level	6	30,004	0.4	0.10	1.90
Occupational background					
Private servant and self-employed	37	344,579	2.9	0.50	14.10
Unpaid worker	40	303,444	7.7	1.70	28.50
Student	8	38,571	1.3	0.20	7.60
Unemployed and jobless	24	157,159	3.8	0.90	15.30
Household monthly income category					
B40	96	781,613	5.1	1.00	22.00
M40 & T20	0	-	-	-	-

Note: All of the above variables should be interpreted with caution as the relative standard errors (RSE) were > 0.25, except for East Malaysia (RSE=0.127).

Table 3 - Factor associated with the USF users in Malaysia, 2020

Variables	COR ^a	95%CI		p-value	AOR ^b	95%CI		p-value
		Lower	Upper			Lower	Upper	
Region - Strata								
West Malaysia - Urban	(Ref)				(Ref)			
West Malaysia - Rural	2.67	0.488	14.599	0.257	1.008	0.155	6.55	0.994
East Malaysia - Urban	114.37	27.942	468.136	<.001	31.398	6.82	144.548	<.001
East Malaysia - Rural	46.151	11.055	192.663	<.001	5.577	1.184	26.265	0.03
Age group								
15-24	2.734	1.207	6.193	0.016				
25-34	2.034	0.873	4.741	0.100				
35-44	1.111	0.44	2.805	0.824				
45-54	1.739	0.715	4.228	0.222				
55-64	1.189	0.457	3.091	0.722				
65+	(Ref)							
Gender								
Male	(Ref)							
Female	1.218	0.829	1.79	0.315				
Ethnicities								
Malay	0.012	0.004	0.03	<.001	0.219	0.058	0.836	0.026
Bumiputera Sabah	1.038	0.666	1.619	0.869	2.305	0.894	5.942	0.084
Bumiputera Sarawak	0.079	0.028	0.225	<.001	0.126	0.031	0.513	0.004
Orang Asli	0.396	0.091	1.731	0.218	7.791	0.892	68.011	0.063
Others	(Ref)				(Ref)			
Citizenship								
Malaysian	(Ref)				(Ref)			
Permanent Residents & Non-Malaysian	11.49	7.661	17.232	<.001	2.805	1.099	7.16	0.031
Education background								
No formal education	35.114	14.713	83.802	<.001	15.447	5.737	41.589	<.001
Primary level	8.286	3.501	19.61	<.001	8.008	3.112	20.61	<.001
Secondary level	1.843	0.742	4.581	0.188	1.824	0.707	4.709	0.214
Tertiary level	(Ref)				(Ref)			
Occupational background								
Private servant and self-employed	0.634	0.376	1.067	0.086				
Unpaid worker	1.563	0.933	2.619	0.090				
Student	0.534	0.238	1.199	0.128				
Unemployed and jobless	(Ref)				(Ref)			

Note: ^aCOR = crude odd ratio; ^bAOR = adjusted odd ratio, Enter method, no interaction and no multicollinearity between variables, Hosmer-Lemeshow ($p=0.055$), classification table (97.5%) and area under curve (94.2%).

