WSS/JMP

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WHO/UNICEF Joint Monitoring Program: Water Supply and Sanitation

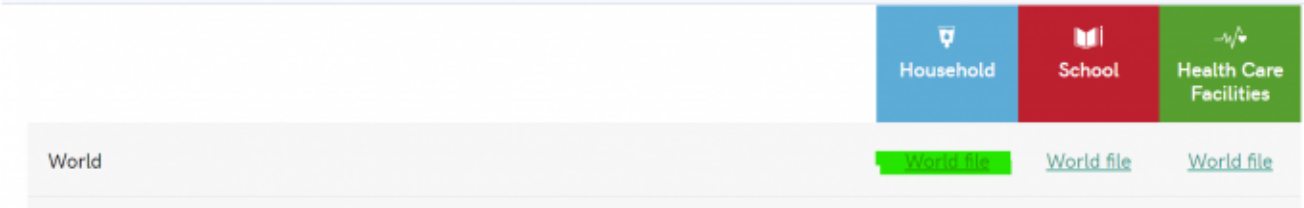
The water and sanitation series is developed using data from the WHO/UNICEF Joint Monitoring Program for water supply and sanitation (JMP). The JMP reports country, regional and global estimates of progress on drinking water, sanitation and hygiene (WASH) since 2000.

The WSS JMP dataset provides substantial information on water, sanitation and hygiene, broken into national, urban and rural subgroups. Within these subgroups, global estimates are provided that show the proportion of a country's population using improved and unimproved access to water, sanitation and hygiene. For the water dataset, IFs draws primarily on..... For the sanitation dataset, IFs uses the sanitation estimates to break the data down into the proportion of population (%) and the amount of people within a population. To construct these data series, IFs draws primarily on the population served with improved sanitation, unimproved sanitation, other unimproved sanitation, shared sanitation, and open defication sanitation.

The most recent update was in Sept. 2024. There are 8 preprocessors and 100 non-preprocessors.

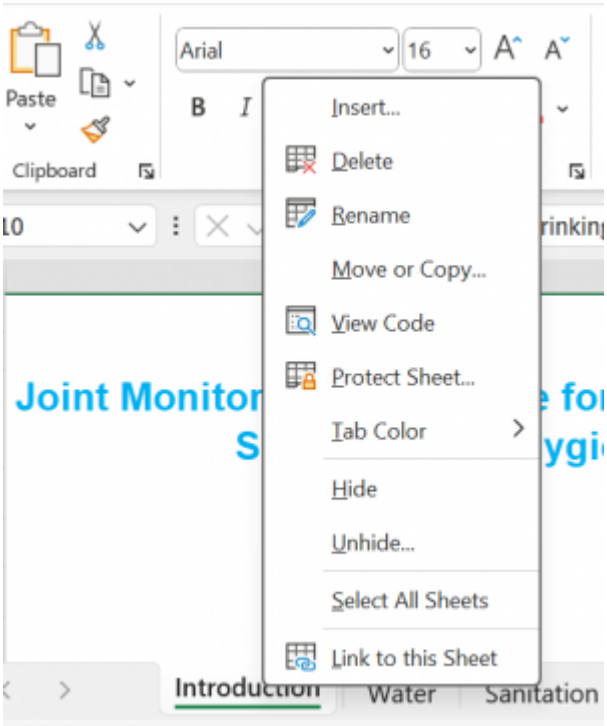
Instructions on Downloading data

1. Go to https://washdata.org/data/downloads#WLD
2. Click "World file" under "Household" to download all the data.

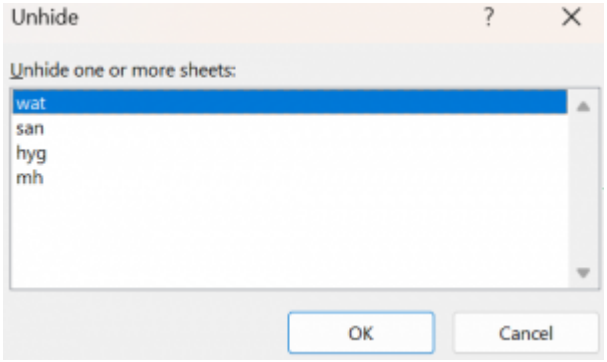


3. Open the downloaded file. "Enable Editing". Hover the mouse to the tab and right-click.

The file will show several options:



4. Click "Unhide", and a view will pop up.



5. Press "ctrl" and select "wat" and "san". Click "OK".
6. In these 2 tabs, you may find the columns we will use in "Code in Source" listed below.

Instructions on Importing Water Data into IFs

This section explains the methodology to be followed when importing WSS JMP water supply data into IFs. It also describes certain problems that a user might face in interpreting and understanding the data.

Source: Water supply data is published by the WHO/UNICEF JMP. The data is available at the website https://washdata.org/data/downloads#WLD

Country List to be Used: WSS JMP

Ladder and Related code in downloaded data:

TAB	Ladder	Ladder(Code)
wat	AtLeastBasic	basal
wat	Basic	basal - sm
wat	**Improved**	basal + lim
wat	Limited	lim
wat	OtherUnimproved	unimp
wat	Piped	pip
wat	SafelyManaged	sm
wat	SMAsNeeded	imp_av
wat	SMNotContam	imp_qual
wat	SMOnPremise	imp_prem
wat	Surface	ns
wat	OtherImproved	imp_npip
wat	Unimproved	100 - **Improved** - ns

Types of Data: The following categories of data need to be imported into IFs:

- Can be directly found

- Units is "Percent" - 30 in total

TAB	Residence Type	Ladder	Variable	Definition	Extended Source Defn	Units	Code in Source	UsedInPreprocessor	UsedInPreprocessorFileName
wat	rural	AtLeastBasic	WSSJMPWaterRural%AtLeastBasic	Proportion of Rural population served with at least basic drinking water (%)		Percent	wat_basal_r	0	
wat	total	AtLeastBasic	WSSJMPWaterTotal%AtLeastBasic	Proportion of Total population served with at least basic drinking water (%)		Percent	wat_basal_t	0	
wat	urban	AtLeastBasic	WSSJMPWaterUrban%AtLeastBasic	Proportion of Urban population served with at least basic drinking water (%)		Percent	wat_basal_u	0	
wat	rural	Limited	WSSJMPWaterRural%Limited	Proportion of Rural population served with limited drinking water (%)	Drinking water from an improved source for which collection time exceeds 30 minutes for a roundtrip including queuing	Percent	wat_lim_r	0	
wat	total	Limited	WSSJMPWaterTotal%Limited	Proportion of Total population served with limited drinking water (%)	Drinking water from an improved source for which collection time exceeds 30 minutes for a roundtrip including queuing	Percent	wat_lim_t	0	
wat	urban	Limited	WSSJMPWaterUrban%Limited	Proportion of Urban population served with limited drinking water (%)	Drinking water from an improved source for which collection time exceeds 30 minutes for a roundtrip including queuing	Percent	wat_lim_u	0	
wat	rural	OtherUnimproved	WSSJMPWaterRural%OtherUnimproved	Proportion of Rural population with Other Unimproved Water (%)	Unprotected dug well, unprotected spring, cart with small tank/drum, tanker truck, bottled water (Bottled water is considered 'improved' for drinking only when the household used an improved source for cooking and personal hygiene)	Percent	wat_unimp_r	0	
wat	total	OtherUnimproved	WSSJMPWaterTotal%OtherUnimproved	Proportion of Total population with Other Unimproved Water (%)	Unprotected dug well, unprotected spring, cart with small tank/drum, tanker truck, bottled water (Bottled water is considered 'improved' for drinking only when the household used an improved source for cooking and personal hygiene)	Percent	wat_unimp_t	1	ECONOMY, INFRASTRUCTURE
wat	urban	OtherUnimproved	WSSJMPWaterUrban%OtherUnimproved	Proportion of Urban population with Other Unimproved Water (%)	Unprotected dug well, unprotected spring, cart with small tank/drum, tanker truck, bottled water (Bottled water is considered 'improved' for drinking only when the household used an improved source for cooking and personal hygiene)	Percent	wat_unimp_u	0	
wat	rural	Piped	WSSJMPWaterRural%Piped	Proportion of Rural population served with Piped Water (%)	Piped household water connection located inside the user's dwelling, plot or yard	Percent	wat_pip_r	0	
wat	total	Piped	WSSJMPWaterTotal%Piped	Proportion of Total population served with Piped Water (%)	Piped household water connection located inside the user's dwelling, plot or yard	Percent	wat_pip_t	1	INFRASTRUCTURE
wat	urban	Piped	WSSJMPWaterUrban%Piped	Proportion of Urban population served with Piped Water (%)	Piped household water connection located inside the user's dwelling, plot or yard	Percent	wat_pip_u	0	
wat	rural	SafelyManaged	WSSJMPWaterRural%SafelyManaged	Proportion of Rural population served with safely managed drinking water (%)	From an improved water source that is accessible on premises, available when needed and free from faecal and priority chemical contamination	Percent	wat_sm_r	0	
wat	total	SafelyManaged	WSSJMPWaterTotal%SafelyManaged	Proportion of Total population served with safely managed drinking water (%)	From an improved water source that is accessible on premises, available when needed and free from faecal and priority chemical contamination	Percent	wat_sm_t	0	
wat	urban	SafelyManaged	WSSJMPWaterUrban%SafelyManaged	Proportion of Urban population served with safely managed drinking water (%)	From an improved water source that is accessible on premises, available when needed and free from faecal and priority chemical contamination	Percent	wat_sm_u	0	
wat	rural	SMAsNeeded	WSSJMPWaterRural%SMAsNeeded	Proportion of Rural population served with available when needed improved drinking water (%)	From an improved water source that is vailable when needed	Percent	wat_imp_av_r	0	
wat	total	SMAsNeeded	WSSJMPWaterTotal%SMAsNeeded	Proportion of Total population served with available when needed improved drinking water (%)	From an improved water source that is vailable when needed	Percent	wat_imp_av_t	0	
wat	urban	SMAsNeeded	WSSJMPWaterUrban%SMAsNeeded	Proportion of Urban population served with available when needed improved drinking water (%)	From an improved water source that is vailable when needed	Percent	wat_imp_av_u	0	
wat	rural	SMNotContam	WSSJMPWaterRural%SMNotContam	Proportion of Rural population served with free from contamination improved drinking water (%)	From an improved water source that is free from faecal and priority chemical contamination	Percent	wat_imp_qual_r	0	
wat	total	SMNotContam	WSSJMPWaterTotal%SMNotContam	Proportion of Total population served with free from contamination improved drinking water (%)	From an improved water source that is free from faecal and priority chemical contamination	Percent	wat_imp_qual_t	0	
wat	urban	SMNotContam	WSSJMPWaterUrban%SMNotContam	Proportion of Urban population served with free from contamination improved drinking water (%)	From an improved water source that is free from faecal and priority chemical contamination	Percent	wat_imp_qual_u	0	
wat	rural	SMOnPremise	WSSJMPWaterRural%SMOnPremise	Proportion of Rural population served with accessible on premises improved drinking water (%)	From an improved water source that is accessible on premises	Percent	wat_imp_prem_r	0	
wat	total	SMOnPremise	WSSJMPWaterTotal%SMOnPremise	Proportion of Total population served with accessible on premises improved drinking water (%)	From an improved water source that is accessible on premises	Percent	wat_imp_prem_t	0	
wat	urban	SMOnPremise	WSSJMPWaterUrban%SMOnPremise	Proportion of Urban population served with accessible on premises improved drinking water (%)	From an improved water source that is accessible on premises	Percent	wat_imp_prem_u	0	
wat	rural	Surface	WSSJMPWaterRural%Surface	Proportion of Rural population served with surface drinking water (%)	Drinking water directly from a river, dam, lake, pond, stream, canal or irrigation canal	Percent	wat_ns_r	0	
wat	total	Surface	WSSJMPWaterTotal%Surface	Proportion of Total population served with surface drinking water (%)	Drinking water directly from a river, dam, lake, pond, stream, canal or irrigation canal	Percent	wat_ns_t	1	ECONOMY, INFRASTRUCTURE
wat	urban	Surface	WSSJMPWaterUrban%Surface	Proportion of Urban population served with surface drinking water (%)	Drinking water directly from a river, dam, lake, pond, stream, canal or irrigation canal	Percent	wat_ns_u	0	
wat	rural	OtherImproved	WSSJMPWaterRural%OtherImproved	Proportion of Rural population served with Other Improved Water (%)	Public taps or standpipes, tube wells or boreholes, protected dug wells, protected springs, rainwater collection	Percent	wat_imp_npip_r	0	
wat	total	OtherImproved	WSSJMPWaterTotal%OtherImproved	Proportion of Total population served with Other Improved Water (%)	Public taps or standpipes, tube wells or boreholes, protected dug wells, protected springs, rainwater collection	Percent	wat_imp_npip_t	1	INFRASTRUCTURE
wat	urban	OtherImproved	WSSJMPWaterUrban%OtherImproved	Proportion of Urban population served with Other Improved Water (%)	Public taps or standpipes, tube wells or boreholes, protected dug wells, protected springs, rainwater collection	Percent	wat_imp_npip_u	0	

- Units is "Thousands" - 12 in total

TAB	Residence Type	Ladder	Variable	Definition	Extended Source Defn	Units	Code in Source	UsedInPreprocessor	UsedInPreprocessorFileName	Formula	Pop
wat	rural	OtherImproved	WSSJMPWaterRuralPopOtherImproved	Rural population served with Other Improved Water	Public taps or standpipes, tube wells or boreholes, protected dug wells, protected springs, rainwater collection	Thousands	wat_imp_npip_r	0		/100	*(100-prop_u)/100*pop_t
wat	total	OtherImproved	WSSJMPWaterTotalPopOtherImproved	Total population served with Other Improved Water	Public taps or standpipes, tube wells or boreholes, protected dug wells, protected springs, rainwater collection	Thousands	wat_imp_npip_t	0		/100	*pop_t
wat	urban	OtherImproved	WSSJMPWaterUrbanPopOtherImproved	Urban population served with Other Improved Water	Public taps or standpipes, tube wells or boreholes, protected dug wells, protected springs, rainwater collection	Thousands	wat_imp_npip_u	0		/100	*prop_u/100*pop_t
wat	rural	OtherUnimproved	WSSJMPWaterRuralPopOtherUnimproved	Rural population with Other Unimproved Water	Unprotected dug well, unprotected spring, cart with small tank/drum, tanker truck, bottled water (Bottled water is considered 'improved' for drinking only when the household used an improved source for cooking and personal hygiene)	Thousands	wat_unimp_r	0		/100	*(100-prop_u)/100*pop_t
wat	total	OtherUnimproved	WSSJMPWaterTotalPopOtherUnimproved	Total population with Other Unimproved Water	Unprotected dug well, unprotected spring, cart with small tank/drum, tanker truck, bottled water (Bottled water is considered 'improved' for drinking only when the household used an improved source for cooking and personal hygiene)	Thousands	wat_unimp_t	0		/100	*pop_t
wat	urban	OtherUnimproved	WSSJMPWaterUrbanPopOtherUnimproved	Urban population with Other Unimproved Water	Unprotected dug well, unprotected spring, cart with small tank/drum, tanker truck, bottled water (Bottled water is considered 'improved' for drinking only when the household used an improved source for cooking and personal hygiene)	Thousands	wat_unimp_u	0		/100	*prop_u/100*pop_t
wat	rural	Piped	WSSJMPWaterRuralPopPiped	Rural population served with Piped Water	Piped household water connection located inside the user's dwelling, plot or yard	Thousands	wat_pip_r	0		/100	*(100-prop_u)/100*pop_t
wat	total	Piped	WSSJMPWaterTotalPopPiped	Total population served with Piped Water	Piped household water connection located inside the user's dwelling, plot or yard	Thousands	wat_pip_t	0		/100	*pop_t
wat	urban	Piped	WSSJMPWaterUrbanPopPiped	Urban population served with Piped Water	Piped household water connection located inside the user's dwelling, plot or yard	Thousands	wat_pip_u	0		/100	*prop_u/100*pop_t
wat	rural	Surface	WSSJMPWaterRuralPopSurface	Rural population with Surface Water	River, dam, lake, pond, stream, canal, irrigation channels.	Thousands	wat_ns_r	0		/100	*(100-prop_u)/100*pop_t
wat	total	Surface	WSSJMPWaterTotalPopSurface	Total population with Surface Water	River, dam, lake, pond, stream, canal, irrigation channels.	Thousands	wat_ns_t	0		/100	*pop_t
wat	urban	Surface	WSSJMPWaterUrbanPopSurface	Urban population with Surface Water	River, dam, lake, pond, stream, canal, irrigation channels.	Thousands	wat_ns_u	0		/100	*prop_u/100*pop_t

- Need Calculation

  - Units is 'Percent" - 9 in total

TAB	Residence Type	Ladder	Variable	Definition	Extended Source Defn	Units	Code in Source	UsedInPreprocessor	UsedInPreprocessorFileName
wat rural		Basic	WSSJMPWaterRural%Basic	Proportion of Rural population served with basic but not safely managed drinking water (%)	Drinking water from an improved source, provided collection time is not more than 30 minutes for a roundtrip including queuing	Percent	wat_basal_r - wat_sm_r	0	
wat total		Basic	WSSJMPWaterTotal%Basic	Proportion of total population served with basic but not safely managed drinking water (%)	Drinking water from an improved source, provided collection time is not more than 30 minutes for a roundtrip including queuing	Percent	wat_basal_t - wat_sm_t	0	
wat urban		Basic	WSSJMPWaterUrban%Basic	Proportion of Urban population served with basic but not safely managed drinking water (%)	Drinking water from an improved source, provided collection time is not more than 30 minutes for a roundtrip including queuing	Percent	wat_basal_u - wat_sm_u	0	
wat rural		Improved	WSSJMPWaterRural%Improved	Proportion of Rural population served with Improved Water (%)	Piped water on premises/other improved drinking water	Percent	wat_basal_r + wat_lim_r	0	
wat total		Improved	WSSJMPWaterTotal%Improved	Proportion of Total population served with Improved Water (%)	Piped water on premises/other improved drinking water	Percent	wat_basal_t + wat_lim_t	0	
wat urban		Improved	WSSJMPWaterUrban%Improved	Proportion of Urban population served with Improved Water (%)	Piped water on premises/other improved drinking water	Percent	wat_basal_u + wat_lim_u	0	
wat rural		Unimproved	WSSJMPWaterRural%Unimproved	Proportion of Rural population served with unimproved drinking water (%)	Drinking water from an unprotected dug well or unprotected spring	Percent	100 - (wat_basal_r + wat_lim_r) - wat_ns_r	0	
wat total		Unimproved	WSSJMPWaterTotal%Unimproved	Proportion of Total population served with unimproved drinking water (%)	Drinking water from an unprotected dug well or unprotected spring	Percent	100 - (wat_basal_t + wat_lim_t) - wat_ns_t	0	
wat urban		Unimproved	WSSJMPWaterUrban%Unimproved	Proportion of Urban population served with unimproved drinking water (%)	Drinking water from an unprotected dug well or unprotected spring	Percent	100 - (wat_basal_u + wat_lim_u) - wat_ns_u	0	

- Units is "Thousands" - 6 in total

Ladder	Variable	Definition	Extended Source Defn	Units	Code in Source	UsedInPreprocessor	UsedInPreprocessorFileName	Formula	Pop
Improved	WSSJMPWaterRuralPopImproved	Rural population served with Improved Water	Piped water on premises/other improved drinking water	Thousands	wat_basal_r + wat_lim_r	0		/100	*(100-prop_u)/100*pop_t
Improved	WSSJMPWaterTotalPopImproved	Total population served with Improved Water	Piped water on premises/other improved drinking water	Thousands	wat_basal_t + wat_lim_t	0		/100	*pop_t
Improved	WSSJMPWaterUrbanPopImproved	Urban population served with Improved Water	Piped water on premises/other improved drinking water	Thousands	wat_basal_u + wat_lim_u	0		/100	*prop_u/100*pop_t
Unimproved	WSSJMPWaterRuralPopUnimproved	Rural population served with Unimproved Water.	Unimproved drinking water sources/surface drinking water sources	Thousands	100 - (wat_basal_r + wat_lim_r) - wat_ns_r	0		/100	*(100-prop_u)/100*pop_t
Unimproved	WSSJMPWaterTotalPopUnimproved	Total population served with Unimproved Water.	Unimproved drinking water sources/surface drinking water sources	Thousands	100 - (wat_basal_t + wat_lim_t) - wat_ns_t	0		/100	*pop_t
Unimproved	WSSJMPWaterUrbanPopUnimproved	Urban population served with Unimproved Water.	Unimproved drinking water sources/surface drinking water sources	Thousands	100 - (wat_basal_u + wat_lim_u) - wat_ns_u	0		/100	*prop_u/100*pop_t

Notes:

1. Any Pop series cannot be directly found in the excel. Thus, we need to manually calculated.
2. pop_t is total population in thousands.
3. prop_u is the percentage of urban population in total population.
4. 100 - prop_u is the percentage of rural population in total population.
5. Except pop_t, the rest of data we will use is in "Percent". To do the calculation for "Pop" series, we need to /100 first to convert the percent to decimal.
6. wat_bas changed to wat_basal.
7. wat_sur changed to wat_ns.
8. Calculated Ladders:
    1. Basic = At least basic + Safely managed
    2. Improved = At least basic + Limited = Piped + Non-piped
    3. Unimproved = 100 - Improved - Surface

Instructions on Importing Sanitation Data into IFs

This section explains the methodology to be followed when importing WSS JMP sanitation data into IFs. It also describes certain problems that a user might face in interpreting and understanding the data.

Source: Sanitation data is published by the WHO/UNICEF JMP. The data is available at the website https://washdata.org/data/household#!/table?geo0=region&geo1=sdg.

Country List to be Used: WSS JMP

Ladder and Related code in downloaded data:

TAB	Ladder	Ladder(Code)
san	AtLeastBasic	basal
san	Basic	basal - sm
san	**Improved**	basal + lim
san	Limited	lim
san	OpenDefecation	ns
san	OtherUnimproved	unimp
san	SafelyManaged	sm
san	Shared	lim
san	SMDisposedInsitu	sdo_sm
san	SMEmpTreated	fst_sm
san	SMWastewaterTreated	sew_sm
san	Unimproved	100 - **Improved** - ns

Types of Data: The following categories of data need to be imported into IFs:

1. **WSSJMPSanitationTotal%Improved**- Describes the proportion of the total population served with improved sanitation (%). Sum of National Latrines, Septic Tanks, Sewer Connections.
2. **WSSJMPSanitationTotal%Unimproved**- Describes the proportion of the total population served with Unimproved Sanitation (%). Total Unimproved Sanitation is the sum of Open Defecation, Other Unimproved, and Shared sanitation access.
3. **WSSJMPSanitationTotal%OtherUnimproved**- Describes the proportion of the total population with Other Unimproved Sanitation (%). National Unimproved
4. **WSSJMPSanitationTotal%Shared-** Describes the proportion of the total population served with Shared Sanitation (%). National Limited (shared)
5. **WSSJMPSanitationTotal%OpenDefecation**- Describes the proportion of the total population served with Open Defecation Sanitation (%). National Open Defecation
6. **WSSJMPSanitationUrban%Improved-** Describes the proportion of the urban population served with Improved Sanitation (%). Sum of National Latrines, Septic Tanks, Sewer Connections.
7. **WSSJMPSanitationUrban%Unimproved-** Describes the proportion of the urban population served with Unimproved Sanitation (%). Urban Unimproved Sanitation is the sum of Open Defecation, Other Unimproved, and Shared sanitation access.
8. **WSSJMPSanitationUrban%OtherUnimproved-** Describes the proportion of the urban population with Other Unimproved Sanitation (%). National Unimproved
9. **WSSJMPSanitationUrban%Shared-** Describes the proportion of the urban population served with Shared Sanitation (%). National Limited (shared)
10. **WSSJMPSanitationUrban%OpenDefecation-** Describes the proportion of the urban population served with Open Defecation Sanitation (%). National Open Defecation
11. **WSSJMPSanitationRural%Improved-** Describes the proportion of the rural population served with Improved Sanitation (%). Sum of National Latrines, Septic Tanks, Sewer Connections.
12. **WSSJMPSanitationRural%Unimproved-** Describes the proportion of the rural population served with Unimproved Sanitation (%). Rural Unimproved Sanitation is the sum of Open Defecation, Other Unimproved, and Shared sanitation access.

13. **WSSJMPSanitationRural%OtherUnimproved-** Describes the proportion of the rural population with Other Unimproved Sanitation (%). National Unimproved
14. **WSSJMPSanitationRural%Shared-** Describes the proportion of the rural population served with Shared Sanitation (%). National Limited (shared)
15. **WSSJMPSanitationRural%OpenDefecation-** Describes the proportion of the rural population served with Open Defecation Sanitation (%). National Open Defecation
16. **WSSJMPSanitationTotalPopImproved-** Describes the total population served with Improved Sanitation. Calculated by the population*(Sum of Latrines, Septic Tanks, Sewer Connections/100).
17. **WSSJMPSanitationTotalPopUnimproved-** Describes the total population served with Unimproved Sanitation. Total Unimproved Sanitation is the sum of Open Defecation, Other Unimproved, and Shared sanitation access.
18. **WSSJMPSanitationTotalPopOtherUnimproved-** Describes the total population with Other Unimproved Sanitation. Calculated by the population*(National Unimproved/100).
19. **WSSJMPSanitationTotalPopShared-** Describes the total population served with Shared Sanitation. Calculated by the population*(National Limited (shared)/100).
20. **WSSJMPSanitationTotalPopOpenDefecation-** Describes the total population served with Open Defecation Sanitation. Calculated by the population*(National Open Defecation/100)
21. **WSSJMPSanitationUrbanPopImproved-** Describes the urban population served with Improved Sanitation. Calculated by the population*(Urban Pop/100)*(Sum of Latrines, Septic Tanks, Sewer Connections/100)
22. **WSSJMPSanitationUrbanPopUnimproved-** Describes the urban population served with Unimproved Sanitation. Urban Unimproved Sanitation is the sum of Open Defecation, Other Unimproved, and Shared sanitation access.
23. **WSSJMPSanitationUrbanPopOtherUnimproved-** Describes the urban population with Other Unimproved Sanitation. Calculated by the population*(Urban Pop/100)*(Urban Unimproved).
24. **WSSJMPSanitationUrbanPopShared-** Describes the urban population served with Shared Sanitation. Calculated by the population*(Urban Pop/100)*(Urban Limited (shared)/100).
25. **WSSJMPSanitationUrbanPopOpenDefecation-** Describes the urban population served with Open Defecation Sanitation. Calculated by the population*(Urban Pop/100)*(Urban Open Defecation/100).
26. **WSSJMPSanitationRuralPopImproved-** Describes the rural population served with Improved Sanitation. Calculated by the population*(100-Urban Pop)*(Sum of Latrines, Septic Tanks, Sewer Connections / 100).
27. **WSSJMPSanitationRuralPopUnimproved-** Describes the rural population served with Unimproved Sanitation. Rural Unimproved Sanitation is the sum of Open Defecation, Other Unimproved, and Shared sanitation access.
28. **WSSJMPSanitationRuralPopOtherUnimproved-** Describes the rural population with Other Unimproved Sanitation, Calculated by the population*(100-Urban Pop/100)*(Rural Unimproved/100).
29. **WSSJMPSanitationRuralPopShared-** Describes the rural population served with Shared

Sanitation. Calculated by the population*(100-Urban Pop/100)*(Rural Limited (shared)/100).

30. **WSSJMPSanitationRuralPopOpenDefecation-** Describes the rural population served with Open Defecation Sanitation. Calculated by the population*(100-Urban Pop/100)*(Rural Open Defecation/100)

- Can be directly found

  - Units is "Percent" - 27 in total

TAB	Residence Type	Ladder	Variable	Definition	Extended Source Defn	Units	Code in Source	UsedInPreprocessor	UsedInPreprocessorFileName
san	rural	AtLeastBasic	WSSJMPSanitationRural%AtLeastBasic	Proportion of Rural population served with at least basic facilities (%)		Percent	san_basal_r	0	
san	total	AtLeastBasic	WSSJMPSanitationTotal%AtLeastBasic	Proportion of Total population served with at least basic facilities (%)		Percent	san_basal_t	0	
san	urban	AtLeastBasic	WSSJMPSanitationUrban%AtLeastBasic	Proportion of Urban population served with at least basic facilities (%)		Percent	san_basal_u	0	
san	rural	Limited	WSSJMPSanitationRural%Limited	Proportion of Rural population served with limited facilities (%)	Use of improved facilities shared between two or more households	Percent	san_lim_r	0	
san	total	Limited	WSSJMPSanitationTotal%Limited	Proportion of Total population served with limited facilities (%)	Use of improved facilities shared between two or more households	Percent	san_lim_t	0	
san	urban	Limited	WSSJMPSanitationUrban%Limited	Proportion of Urban population served with limited facilities (%)	Use of improved facilities shared between two or more households	Percent	san_lim_u	0	
san	rural	OpenDefecation	WSSJMPSanitationRural%OpenDefecation	Proportion of Rural population served with open defecation facilities (%)	Disposal of human faeces in fields, forests, bushes, open bodies of water, beaches and other open spaces or with solid waste	Percent	san_ns_r	0	
san	total	OpenDefecation	WSSJMPSanitationTotal%OpenDefecation	Proportion of Total population served with open defecation facilities (%)	Disposal of human faeces in fields, forests, bushes, open bodies of water, beaches and other open spaces or with solid waste	Percent	san_ns_t	1	ECONOMY, INFRASTRUCTURE
san	urban	OpenDefecation	WSSJMPSanitationUrban%OpenDefecation	Proportion of Urban population served with open defecation facilities (%)	Disposal of human faeces in fields, forests, bushes, open bodies of water, beaches and other open spaces or with solid waste	Percent	san_ns_u	0	
san	rural	OtherUnimproved	WSSJMPSanitationRural%OtherUnimproved	Proportion of Rural population with Other Unimproved Sanitation (%)	do not ensure hygenic separation of human excreta from human contact. Unimproved facilities include pit latrines without a slab or platform, hanging latrines or bucket latrines	Percent	san_unimp_r	0	
san	total	OtherUnimproved	WSSJMPSanitationTotal%OtherUnimproved	Proportion of Total population with Other Unimproved Sanitation (%)	do not ensure hygenic separation of human excreta from human contact. Unimproved facilities include pit latrines without a slab or platform, hanging latrines or bucket latrines	Percent	san_unimp_t	1	ECONOMY, INFRASTRUCTURE
san	urban	OtherUnimproved	WSSJMPSanitationUrban%OtherUnimproved	Proportion of Urban population with Other Unimproved Sanitation (%)	do not ensure hygenic separation of human excreta from human contact. Unimproved facilities include pit latrines without a slab or platform, hanging latrines or bucket latrines	Percent	san_unimp_u	0	
san	rural	SafelyManaged	WSSJMPSanitationRural%SafelyManaged	Proportion of Rural population served with safely managed facilities (%)	Use of improved facilities that are not shared with other households and where excreta are safely disposed of in situ or removed and treated offsite	Percent	san_sm_r	0	
san	total	SafelyManaged	WSSJMPSanitationTotal%SafelyManaged	Proportion of Total population served with safely managed facilities (%)	Use of improved facilities that are not shared with other households and where excreta are safely disposed of in situ or removed and treated offsite	Percent	san_sm_t	0	
san	urban	SafelyManaged	WSSJMPSanitationUrban%SafelyManaged	Proportion of Urban population served with safely managed facilities (%)	Use of improved facilities that are not shared with other households and where excreta are safely disposed of in situ or removed and treated offsite	Percent	san_sm_u	0	
san	rural	Shared	WSSJMPSanitationRural%Shared	Proportion of Rural population served with Shared Sanitation (%)	Sanitation facilities of an otherwise acceptable type shared between two or more households. Only facilities that are not shared or not public are considered improved	Percent	san_lim_r	0	
san	total	Shared	WSSJMPSanitationTotal%Shared	Proportion of Total population served with Shared Sanitation (%)	Sanitation facilities of an otherwise acceptable type shared between two or more households. Only facilities that are not shared or not public are considered improved	Percent	san_lim_t	1	INFRASTRUCTURE
san	urban	Shared	WSSJMPSanitationUrban%Shared	Proportion of Urban population served with Shared Sanitation (%)	Sanitation facilities of an otherwise acceptable type shared between two or more households. Only facilities that are not shared or not public are considered improved	Percent	san_lim_u	0	
san	rural	SMDisposedInsitu	WSSJMPSanitationRural%SMDisposedInsitu	Proportion of Rural population served with safely managed facilities (%) that are disposed in situ	Safely managed = disposed in situ + emptied and treated + wastewater and treated	Percent	san_sdo_sm_r	0	
san	total	SMDisposedInsitu	WSSJMPSanitationTotal%SMDisposedInsitu	Proportion of Total population served with safely managed facilities (%) that are disposed in situ	Safely managed = disposed in situ + emptied and treated + wastewater and treated	Percent	san_sdo_sm_t	0	
san	urban	SMDisposedInsitu	WSSJMPSanitationUrban%SMDisposedInsitu	Proportion of Urban population served with safely managed facilities (%) that are disposed in situ	Safely managed = disposed in situ + emptied and treated + wastewater and treated	Percent	san_sdo_sm_u	0	
san	rural	SMEmpTreated	WSSJMPSanitationRural%SMEmpTreated	Proportion of Rural population served with safely managed facilities (%) that are emptied and treated	Safely managed = disposed in situ + emptied and treated + wastewater and treated	Percent	san_fst_sm_r	0	
san	total	SMEmpTreated	WSSJMPSanitationTotal%SMEmpTreated	Proportion of Total population served with safely managed facilities (%) that are emptied and treated	Safely managed = disposed in situ + emptied and treated + wastewater and treated	Percent	san_fst_sm_t	0	
san	urban	SMEmpTreated	WSSJMPSanitationUrban%SMEmpTreated	Proportion of Urban population served with safely managed facilities (%) that are emptied and treated	Safely managed = disposed in situ + emptied and treated + wastewater and treated	Percent	san_fst_sm_u	0	
san	rural	SMWastewaterTreated	WSSJMPSanitationRural%SMWastewaterTreated	Proportion of Rural population served with safely managed facilities (%) that are wastewater treated	Safely managed = disposed in situ + emptied and treated + wastewater and treated	Percent	san_sew_sm_r	0	
san	total	SMWastewaterTreated	WSSJMPSanitationTotal%SMWastewaterTreated	Proportion of Total population served with safely managed facilities (%) that are wastewater treated	Safely managed = disposed in situ + emptied and treated + wastewater and treated	Percent	san_sew_sm_t	0	
san	urban	SMWastewaterTreated	WSSJMPSanitationUrban%SMWastewaterTreated	Proportion of Urban population served with safely managed facilities (%) that are wastewater treated	Safely managed = disposed in situ + emptied and treated + wastewater and treated	Percent	san_sew_sm_u	0	

- Units is "Thousands" - 9 in total

TAB	Residence Type	Ladder	Variable	Definition	Extended Source Defn	Units	Code in Source	UsedInPreprocessor	UsedInPreprocessorFileName	Formula	Pop
san	rural	Limited	WSSJMPSanitationRuralPopShared	Rural population served with Shared Sanitation	Sanitation facilities of an otherwise acceptable type shared between two or more households. Only facilities that are not shared or not public are considered improved	Thousands	san_lim_r	0		/100	*(100-prop_u)/100*pop_t
san	total	Limited	WSSJMPSanitationTotalPopShared	Total population served with Shared Sanitation	Sanitation facilities of an otherwise acceptable type shared between two or more households. Only facilities that are not shared or not public are considered improved	Thousands	san_lim_t	0		/100	*pop_t
san	urban	Limited	WSSJMPSanitationUrbanPopShared	Urban population served with Shared Sanitation	Sanitation facilities of an otherwise acceptable type shared between two or more households. Only facilities that are not shared or not public are considered improved	Thousands	san_lim_u	0		/100	*prop_u/100*pop_t
san	rural	OpenDefecation	WSSJMPSanitationRuralPopOpenDefecation	Rural population served with Open Defecation Sanitation	when human feces are disposed of in fields, forests, bushes, open bodies of water, beaches or other open spaces or disposed of with solid waste	Thousands	san_ns_r	0		/100	*(100-prop_u)/100*pop_t
san	total	OpenDefecation	WSSJMPSanitationTotalPopOpenDefecation	Total population served with Open Defecation Sanitation	when human feces are disposed of in fields, forests, bushes, open bodies of water, beaches or other open spaces or disposed of with solid waste	Thousands	san_ns_t	0		/100	*pop_t
san	urban	OpenDefecation	WSSJMPSanitationUrbanPopOpenDefecation	Urban population served with Open Defecation Sanitation	when human feces are disposed of in fields, forests, bushes, open bodies of water, beaches or other open spaces or disposed of with solid waste	Thousands	san_ns_u	0		/100	*prop_u/100*pop_t
san	rural	OtherUnimproved	WSSJMPSanitationRuralPopOtherUnimproved	Rural population with Other Unimproved Sanitation	do not ensure hygenic separation of human excreta from human contact. Unimproved facilities include pit latrines without a slab or platfor, hanging latrines or bucket latrines	Thousands	san_unimp_r	0		/100	*(100-prop_u)/100*pop_t
san	total	OtherUnimproved	WSSJMPSanitationTotalPopOtherUnimproved	Total population with Other Unimproved Sanitation	do not ensure hygenic separation of human excreta from human contact. Unimproved facilities include pit latrines without a slab or platfor, hanging latrines or bucket latrines	Thousands	san_unimp_t	0		/100	*pop_t
san	urban	OtherUnimproved	WSSJMPSanitationUrbanPopOtherUnimproved	Urban population with Other Unimproved Sanitation	do not ensure hygenic separation of human excreta from human contact. Unimproved facilities include pit latrines without a slab or platfor, hanging latrines or bucket latrines	Thousands	san_unimp_u	0		/100	*prop_u/100*pop_t

- Calculation

  - Units is "Percent" - 9 in total

TAB	Residence Type	Ladder	Variable	Definition	Extended Source Defn	Units	Code in Source	UsedInPreprocessor	UsedInPreprocessorFileName
san	rural	Basic	WSSJMPSanitationRural%Basic	Proportion of Rural population served with basic but not safely managed facilities (%)	Use of improved facilities which are not shared with other households	Percent	san_basal_r - san_sm_r	0	
san	total	Basic	WSSJMPSanitationTotal%Basic	Proportion of total population served with basic but not safely managed facilities (%)	Use of improved facilities which are not shared with other households	Percent	san_basal_t - san_sm_t	0	
san	urban	Basic	WSSJMPSanitationUrban%Basic	Proportion of Urban population served with basic but not safely managed facilities (%)	Use of improved facilities which are not shared with other households	Percent	san_basal_u - san_sm_u	0	
san	rural	Improved	WSSJMPSanitationRural%Improved	Proportion of Rural population served with Improved Sanitation (%)	Likely to ensure hygenic separation of human excreta from human contact. They include: 1) Flush/pour flush to (piped sewer system septic tank or pit latrine) 2) Ventilated improved pit (VIP) latrine 3) Pit latrine with slab 4) Composing toilet	Percent	san_basal_r + san_lim_r	0	
san	total	Improved	WSSJMPSanitationTotal%Improved	Proportion of Total population served with Improved Sanitation (%)	Likely to ensure hygenic separation of human excreta from human contact. They include: 1) Flush/pour flush to (piped sewer system septic tank or pit latrine) 2) Ventilated improved pit (VIP) latrine 3) Pit latrine with slab 4) Composing toilet	Percent	san_basal_t + san_lim_t	1	INFRASTRUCTURE
san	urban	Improved	WSSJMPSanitationUrban%Improved	Proportion of Urban population served with Improved Sanitation (%)	Likely to ensure hygenic separation of human excreta from human contact. They include: 1) Flush/pour flush to (piped sewer system septic tank or pit latrine) 2) Ventilated improved pit (VIP) latrine 3) Pit latrine with slab 4) Composing toilet	Percent	san_basal_u + san_lim_u	0	
san	rural	Unimproved	WSSJMPSanitationRural%Unimproved	Proportion of Rural population served with unimproved facilities (%)	Use of pit latrines without a slab or platform, hanging latrines or bucket latrines	Percent	100 - (san_basal_r + san_lim_r) - san_ns_r	0	
san	total	Unimproved	WSSJMPSanitationTotal%Unimproved	Proportion of Total population served with unimproved facilities (%)	Use of pit latrines without a slab or platform, hanging latrines or bucket latrines	Percent	100 - (san_basal_t + san_lim_t) - san_ns_t	0	
san	urban	Unimproved	WSSJMPSanitationUrban%Unimproved	Proportion of Urban population served with unimproved facilities (%)	Use of pit latrines without a slab or platform, hanging latrines or bucket latrines	Percent	100 - (san_basal_u + san_lim_u) - san_ns_u	0	

- Units is "Thousands" - 6 in total

TAB	Residence Type	Ladder	Variable	Definition	Extended Source Defn	Units	Code in Source	UsedInPreprocessor	UsedInPreprocessorFileName	Formula	Pop
san	rural	Improved	WSSJMPSanitationRuralPopImproved	Rural population served with Improved Sanitation	Likely to ensure hygenic separation of human excreta from human contact. They include: 1) Flush/pour flush to (piped sewer system septic tank or pit latrine) 2) Ventilated improved pit (VIP) latrine 3) Pit latrine with slab 4) Composing toilet	Thousands	san_basal_r + san_lim_r	0		/100	*(100-prop_u)/100*pop_t
san	total	Improved	WSSJMPSanitationTotalPopImproved	Total population served with Improved Sanitation	Likely to ensure hygenic separation of human excreta from human contact. They include: 1) Flush/pour flush to (piped sewer system septic tank or pit latrine) 2) Ventilated improved pit (VIP) latrine 3) Pit latrine with slab 4) Composing toilet	Thousands	san_basal_t + san_lim_t	0		/100	*pop_t
san	urban	Improved	WSSJMPSanitationUrbanPopImproved	Urban population served with Improved Sanitation	Likely to ensure hygenic separation of human excreta from human contact. They include: 1) Flush/pour flush to (piped sewer system septic tank or pit latrine) 2) Ventilated improved pit (VIP) latrine 3) Pit latrine with slab 4) Composing toilet	Thousands	san_basal_u + san_lim_u	0		/100	*prop_u/100*pop_t
san	rural	Unimproved	WSSJMPSanitationRuralPopUnimproved	Rural population served with Unimproved Sanitation.	do not ensure hygenic separation of human excreta from human contact. Unimproved facilities include pit latrines without a slab or platform, hanging latrines or bucket latrines	Thousands	100 - (san_basal_r + san_lim_r) - san_ns_r	0		/100	*(100-prop_u)/100*pop_t
san	total	Unimproved	WSSJMPSanitationTotalPopUnimproved	Total population served with Unimproved Sanitation.	do not ensure hygenic separation of human excreta from human contact. Unimproved facilities include pit latrines without a slab or platform, hanging latrines or bucket latrines	Thousands	100 - (san_basal_t + san_lim_t) - san_ns_t	0		/100	*pop_t
san	urban	Unimproved	WSSJMPSanitationUrbanPopUnimproved	Urban population served with Unimproved Sanitation.	do not ensure hygenic separation of human excreta from human contact. Unimproved facilities include pit latrines without a slab or platform, hanging latrines or bucket latrines	Thousands	100 - (san_basal_u + san_lim_u) - san_ns_u	0		/100	*prop_u/100*pop_t

Notes:

1. Any Pop series cannot be directly found in the excel. Thus, we need to manually calculated.
2. pop_t is total population in thousands.
3. prop_u is the percentage of urban population in total population.
4. 100 - prop_u is the percentage of rural population in total population.
5. Except pop_t, the rest of data we will use is in "Percent". To do the calculation for "Pop" series, we need to /100 first to convert the percent to decimal.
6. san_bas changed to san_basal.
7. san_od changed to san_ns.
8. Calculated Ladders:
    1. Basic = At least basic + Safely managed
    2. Improved = At least basic + Limited = Sum of Latrines (san_othimp), Septic Tanks (san_sep), Sewer Connections (san_sew)
    3. Unimproved = 100 - Improved - Open Defecation

Issues in the data and their resolution:

The 3 groups of series below are duplicated: **"Shared" is "Limited service".**

TAB	Residence Type	Ladder	Variable	Definition	Extended Source Defn	Units	Code in Source	UsedInPreprocessor	UsedInPreprocessorFileName
san	rural	Limited	WSSJMPSanitationRural%Limited	Proportion of Rural population served with limited facilities (%)	Use of improved facilities shared between two or more households	Percent	san_lim_r	0	
san	rural	Shared	WSSJMPSanitationRural%Shared	Proportion of Rural population served with Shared Sanitation (%)	Sanitation facilities of an otherwise acceptable type shared between two or more households. Only facilities that are not shared or not public are considered improved	Percent	san_lim_r	0	
san	total	Limited	WSSJMPSanitationTotal%Limited	Proportion of Total population served with limited facilities (%)	Use of improved facilities shared between two or more households	Percent	san_lim_t	0	
san	total	Shared	WSSJMPSanitationTotal%Shared	Proportion of Total population served with Shared Sanitation (%)	Sanitation facilities of an otherwise acceptable type shared between two or more households. Only facilities that are not shared or not public are considered improved	Percent	san_lim_t	1	INFRASTRUCTURE
san	urban	Limited	WSSJMPSanitationUrban%Limited	Proportion of Urban population served with limited facilities (%)	Use of improved facilities shared between two or more households	Percent	san_lim_u	0	
san	urban	Shared	WSSJMPSanitationUrban%Shared	Proportion of Urban population served with Shared Sanitation (%)	Sanitation facilities of an otherwise acceptable type shared between two or more households. Only facilities that are not shared or not public are considered improved	Percent	san_lim_u	0	

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This page was last edited on 10 September 2024, at 16:11.