Annex E: Analysis for national estimates of SMOSS

Guidance for monitoring safely managed on-site sanitation (SMOSS)

WHO and UNICEF, 2025

Background

These annexes accompany the Guidance for Monitoring SMOSS to provide additional details on indicators, core and expanded questions and tools for designing monitoring systems to collect data for SDG 6.2.1. These annexes have been developed as part of the Monitoring SMOSS pilot project and are informed by the pilots conducted in ten countries as part of this project as well as other global examples of monitoring of safely managed sanitation services. The annexes are split into the following documents and are available with the main guidance at https://washdata.org/monitoring/sanitation/safely-managed-on-site-sanitation

A. Global indicators for monitoring SMOSS
B. Data collection – Household questionnaire
C. Data collection – household sanitation inspections
D. Data collection - Service authority and service provider surveys
E. Analysis to inform national estimates for SDG 6.2.1

Annex E – Analysis for national estimates of SMOSS

E.1 Analysis of the sanitation service chain to estimate SMOSS pE-2
- Decision tree, indicators, ratios and assumptions
E.2 Analysing different data sources and scales pE-7
- Reliability and use of different data sources,
- Nationally representative estimates from household and non-household data
- Combining data from different sources

E. Analysis

Analysis of sanitation data to inform national estimates of SMOSS is often challenging due to the multiple steps in the sanitation service chain, the different pathways through which systems may be considered safely managed, and the varied of available data sources. This annex focuses on data analysis to inform the global indicators of safely managed sanitation under the SDG target 6.2; however, the systematic approach could be adapted for analysis of expanded questions and generating local indicators. The assumptions outlined are those applied by the JMP for global estimates and should be reviewed alongside national standards, including methodologies used by national statistical authorities to assess whether data are nationally representative.

The first section details how data from different parts of the service chain are integrated to generate estimates of safely managed sanitation. It includes a flow chart illustrating how responses at each step contribute to classifying services as limited, basic and safely managed, formulas for calculating ratios, and standard assumptions that can be used if data are missing.

The second section outlines key considerations when combining data from multiple sources and administrative levels, which is essential for analysing the full sanitation service chain as household survey data alone cannot inform transport and treatment of faecal sludge. This section identifies the types of data best suited for different analytical needs, discusses how to reconcile data collected at different scales, and describes approaches for combining data sets.

E.1 Analysis of the sanitation service chain to estimate SMOSS

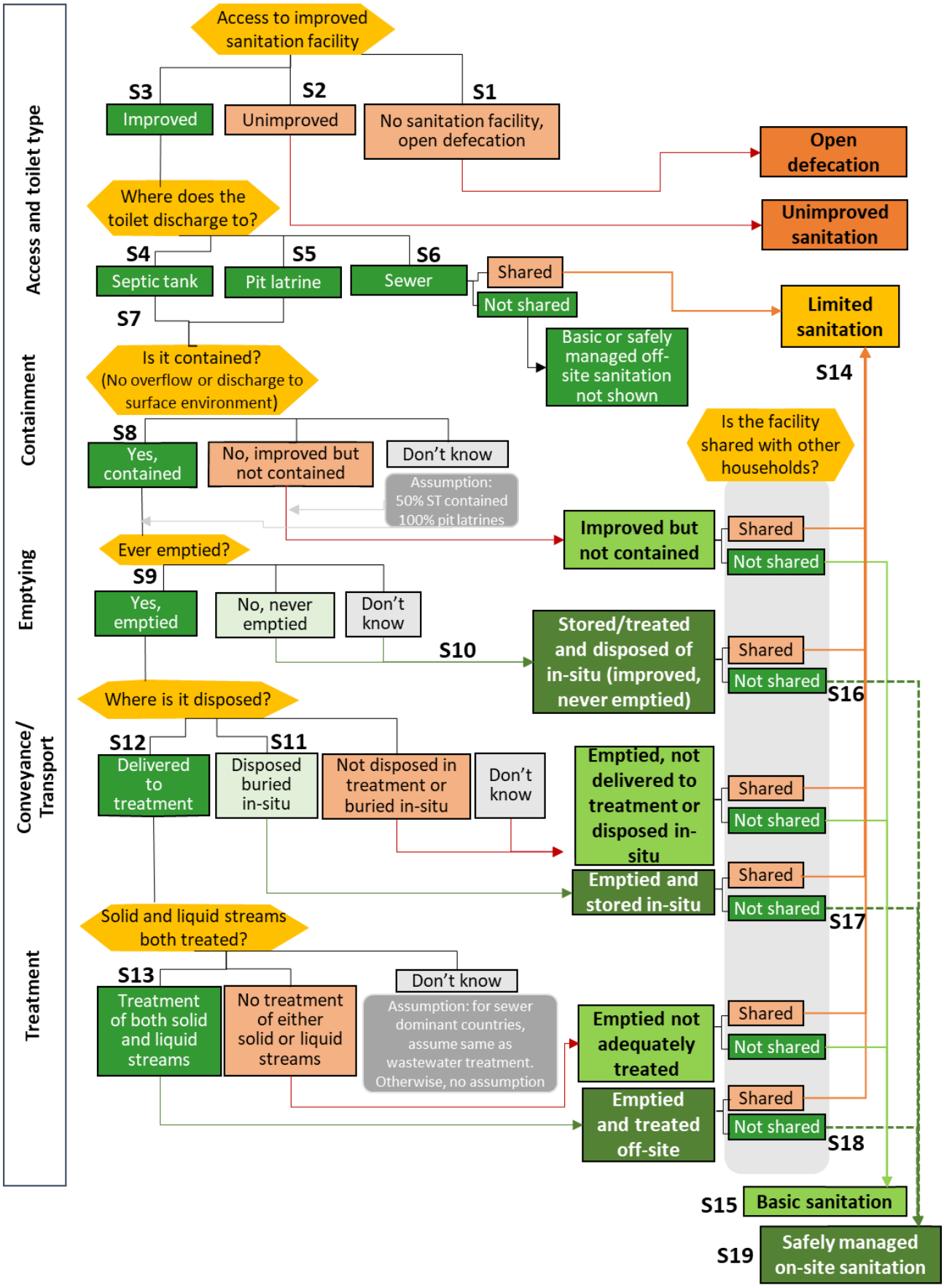
Estimating safely managed sanitation requires a systematic analysis of data on toilet use, containment, emptying, transport and treatment. Different combinations of responses at each step can lead to one of three pathways to safely managed on-site sanitation i) contained and not emptied; ii) contained, emptied and buried in situ; and iii) contained, emptied and treated off-site. This annex focuses on on-site sanitation and does cover calculations for safely managed sanitation achieved through wastewater conveyed via sewers and receiving at least secondary wastewater treatment.

This section provides guidance on translating the findings from the core questions provided in Annexes B-D into estimating of SMOSS through the use of a visual decision tree and calculations for ratios and indicators as well as links to excel calculation and output tables can be generated from data analysis software. Given the calculations refer to the core questions, they must be reviewed if different survey questions or response categories are used.

E.1.1 Decision tree for estimating SMOSS

The decision tree in Figure E1 provides a structured approach for analysing data to produce national estimates of SMOSS for SDG indicator 6.2.1. It illustrates how responses to each core question determine whether a system progresses to the next step in the service chain and which data are used to calculate the different service ladder levels. According to the JMP service ladder, only improved facilities that are not shared (i.e. basic) can be considered safely managed sanitation, therefore systems that otherwise meet safely managed criteria yet are shared with other households are considered a limited service. This figure focuses on on-site sanitation and does not show safely managed off-site sanitation from sewers. The numbering relates to the indicator list shown in Table E1.

Figure E1. Decision tree for analysis of core questions to inform SMOSS global indicators



E.1.2 Global indicators

This section summarises the global indicators for monitoring SMOSS and how they can be estimated from the core questions that are provided in Annexes B-D. If the questions or response categories are modified these calculations, and those in the ratio table below, would require updating. Further definition of these indicators is provided in Annex A- Table A3.

Table E1. Global indicators and core questions for monitoring SMOSS in SDG6.2

Indicator	Definition: the proportion of the population using…	Core questions[1]
S1	No sanitation facility (open defecation)	S01 (95)
S2	Unimproved sanitation facilities	S01(14,15,24,41,51,96)
S3	Improved sanitation facilities	=All HH-S1-S2
*	*Note S4-S13 do not include unimproved facilities but do include shared improved facilities*	
S4	Improved sanitation facilities connected to septic tanks	S01 (12)
S5	Improved pit latrines or other improved sanitation facilities	S01 (13,21,22,23,31, 32)
S6	Toilets connected to sewers	S01 (11,18)
S7	Improved on-site sanitation facilities	=(S4+S5)/All HH
S8	Improved on-site sanitation facilities that are **contained**	=RS2 x S7
S9	Improved on-site sanitation facilities that are contained and **emptied**	=RS3 x S8
S10	Improved on-site sanitation facilities that are contained, not emptied and stored on-site **(treated and disposed of in-situ**)	=(1-RS3) x S8
S11	Improved on-site sanitation facilities that are contained and from which excreta are **emptied and buried in situ**	=RS4 x S9
S12	Improved on-site sanitation facilities from which excreta are **emptied and delivered to treatment** or designated disposal site)	=R5 x S9
S13	Improved on-site sanitation that are contained and from which excreta delivered to treatment are treated **(excreta emptied and treated off-site)**	=RS6 x S12
S14	Improved sanitation facilities which are shared (**Limited sanitation services)**	=RS1 x S3
S15	Improved sanitation facilities which are not shared but are not safely managed **(Basic on-site sanitation services[2])**	=(1-RS1) x S7-S19
S16	Improved on-site sanitation facilities which are not shared, and from which excreta are treated and disposed in-situ (**Safely managed on-site sanitation)**	=(1-RS1) x S10
S17	Improved on-site sanitation which are not shared, and from which excreta are emptied and disposed in-situ (**Safely managed on-site sanitation)**	=(1-RS1) x S11
S18	Improved on-site sanitation which are not shared, and from which excreta are emptied and treated off-site (**Safely managed on-site sanitation)**	=(1-RS1) x S13
S19	**Safely managed on-site sanitation**	=S16+S17+S18
S20	Toilets connected via sewers to treatment plants	=R7 x S6
S21	Toilets connected via sewers to treatment plants where wastes are treated	=R8 x S30
S22	Sewer connections that are not shared but are not safely managed (**Basic off-site sanitation services**)	=(1-RS1) x S6 -S23
S23	Sewer connections that are not shared and wastewater are treated off-site **(Safely managed off-site sanitation)**	=(1-RS1) x S21
S24	**Basic[2] sanitation services** (total on and off-site)	=S15+S22
S25	**Safely managed sanitation services** (total on and off-site)	=S19+S23

Notes: 1. In the first phase SMOSS pilots, most countries did not use a data analysis software to analyse survey data for individual households and instead used a spreadsheet to calculate aggregate proportions for each category. This approach is adequate for national and global monitoring but has some limitations, particularly in the assumption that shared systems are evenly distributed across safe and unsafely managed practices. A data analysis software would enable assessment of multiple criteria for each respondent and therefore provide a more detailed assessment which may be useful for programming.

2. Since households with safely managed services also meet the criteria for basic services, the two levels can be grouped together as '**at least basic'** which is the indicator used for monitoring SDG target 1.4 (universal access to basic services) . In the above Table At least basic = S24 and S25 (basic + safely managed).

E.1.3 Ratios

The ratios for analysis of core indicators in Table E2 relate the different steps of the service chain and are used to calculate the global indicators, as shown in the right column of **Error! Reference source not found.** above. The calculations are based on the suggested core questions and response categories presented in the Data Collection Annexes, therefore will need to be adjusted if different questions or responses are used. The ratios RS1-RS5 relate to the proportion of improved sanitation facilities, with suggested data inputs from household questionnaires and sanitation inspections. Ratios RS6-RS8 relate to excreta and wastewater quantities and are informed from service authority or service provider data. If a data analysis software is used, and the analysis across the service chain can occur for each household response rather than using the ratios.

Table E 1. Ratios for analysis of core indicators

Ratio	Definition	Data
RS1	% improved sanitation facilities that are shared	S01 (improved) AND S02 (shared) / S01(improved) = SUMIF [S01(11,12,13,18,21,22,23,31,32) AND S02(1)] / S01(11,12,13,18,21,22,23,31,32) Ratio includes both on- and off-site improved. Assumes H2 is asked to both improved and unimproved.
RS2	% improved on-site sanitation facilities that are contained	= 1 – {SUMIF [S0b(3,4,5,6,8) OR (any of S04a/b/c/d=1)]} / S7 Alternatively use inspection questions IH3 and IH4 If analysis of two containment issues (outlet and events) cannot be integrated, use the highest issue rather than summing.
RS3	% improved on-site sanitation facilities that are emptied	= S05(1 emptied) / S7 Assumes S05 was just asked to respondents with improved on-site sanitation.
RS4	% improved on-site sanitation facilities that are emptied and disposed of in-situ	= S07a(3,4) / S05(1 emptied) Assumes S05 just asked to those who emptied.
RS5	% improved on-site sanitation facilities from which excreta are emptied and delivered to designated off-site treatment or disposal location	= S07a(1) / S05 (1 emptied) Alternatively, if S07a not included/reliable: = S07a(3 off-site)/ S05 (1) * (proportion disposed to treatment from service authority or service provider data)
RS6	% excreta received from on-site sanitation facilities that is treated	Service authority survey: = SA 40 (a,b) (FSTP) + SA41 (a,b) (WWTP and sewer) Other disposal sites: individual assessment needed to confirm proportion receiving adequate treatment at other disposal sites.
RS7	% wastewater that is delivered to treatment plants	From local government and service provider data (e.g. sewer leakage and overflow rates). Not detailed in this guidance.
RS8	% wastewater delivered to treatment plants that receives treatment	From local government and service provider data (e.g. proportion of wastewater that receives at least secondary treatment). Not detailed in this guidance.

E.1.5 Assumptions

In many cases there are gaps in data on SMOSS or the scale or quality is inadequate to inform some steps of the service chain. For the JMP global estimates, the following general global assumptions are applied to develop estimates in the absence of suitable national data. Where adequate data is available, that data can be used directly to inform indicators or the assumptions can be updated to suit the national context. See section E.2.2 on use of data to inform assumptions.

Table E3. Analysis assumptions

	Global indicators	Analysis and assumptions used for global monitoring
Toilet facility	Use of improved facilities	Disaggregation of septic tanks and pit latrines essential. Further disaggregation of wet and dry pits desirable.
	Not shared with other households	Improved facilities shared with other households do not contribute to safely managed sanitation.
Containment	Containment[1] is not overflowing or discharging waste directly to the surface environment	In the absence of containment data assume that excreta are contained in all latrines and half (50%) of septic tanks. Note: only systems assessed as contained can contribute to safely managed sanitation.
Disposed in-situ	Contained, not emptied	Contained facilities that have never been emptied are considered stored/treated and disposed in-situ.
	Contained, emptied, buried in-situ	Contained facilities that have been emptied and buried are considered disposed of in-situ
Emptying	If containment ever emptied	If onsite is dominant estimates are only made if data available on emptying. 'Don't know' considered never emptied. If sewer connections dominant, in the absence of emptying data 50% of onsite considered safely managed.
Transport	Excreta delivered to off-site treatment facility	In the absence of transport data assume all excreta removed by service providers are delivered to treatment facility. Emptied to 'other/don't know where' are considered unsafe and highlight the problem of unaccounted-for faecal waste.
Treatment	Designed to provide treatment for both solid and liquid phase	In absence of faecal sludge treatment data: a. If sewer connections are more common than on-site sanitation, faecal sludge assumed to receive the same level of treatment as sewered wastewater. b. If on-site sanitation is more prevalent, no estimate is made unless data are available on faecal sludge treatment.
Reuse	Not included in global indicators for SDG 6.2	Not assessed

E.1.6 Analysis tabulation sheets

Available on the JMP WASH data webpage are tools to support analysis of SMOSS data. These include questionnaires for households, inspections, service authorities and service providers, including a template for uploading households surveys into Kobo toolbox. To support analysis the SMOSS data analysis tabulation file includes tables for analyzing household data, that can be generated from the accompanying SPSS syntax file, and calculation sheets for ratios and service chain estimates that draw on the household findings and data from service provider or service authority surveys.

[1] Containment is defined as a permeable or impermeable container for storing excreta close to the toilet or latrine. Examples of containments include latrines pits, cesspools, septic tanks, and holding tanks.

E.2 Analyzing different data sources and scales

E.2.1 Data source reliability and use across the service chain

Given there are multiple sources of data for various steps in the sanitation service chain, it is important to assess how each can best be used to generate the estimates. The table of Table E4 shows which sources of data are best suited to inform each step of the service chain and demonstrates that at least two sources are possible for each step of the service chain. While multiple sources for each step are not necessary, it is often common for there to be overlap in data sources that provide slightly different data on one indicator. For example service providers could have data on the number of containments emptied in a year while household questionnaires provide self-reported emptying frequency. This section provides examples of identifying what sources are best suited to different data uses and considerations for combining data from different sources.

Table E4. Potential data sources to inform global indicators for monitoring SMOSS

Service chain Data collection method	Facility type	Containment	Emptying	Transport	Treatment
Household questionnaire	S1-S6, S14	(S8)	S9, S10	In-situ only S11 (S12)	
Household sanitation inspection	S1-S6	S8			
Data from local government (e.g. Administrative data)			(S9, S10)	S11, S12	S13
Data from service providers (e.g. via regulators)			(S9, S10)	S11, S12	S13
Service chain spot checks / inspections				S11, S12	S13

Levels of reliability and use of source

Low  High

() secondary data source

E.2.2 Various analytical uses of data

There are multiple uses of data, and some sources may be better suited to particular uses. Examples of how different data sources could be applied to inform SMOSS estimates include:

- **Direct estimation of indicators**: For data that is a representative sample of the national population, the data can be analyzed to provide a direct estimate for the indicator. Statistical departments may have criteria of what can be considered nationally representative. For example, assuming the sampling of the household questionnaire is nationally representative it can directly inform indicators S1-S6 as is shown in Table E1.
- **Input to ratios or assumptions:** Some data may not be available at the individual household level but could be representative of an administrative area or other population sub-set and could be used to inform the ratio of service level (Table E2) or an assumption (Table E3). An example of this is inspection data or service provider data that comes from a smaller sample or representative of a specific population or geographic group. Inspection data on containment could inform ratios of the proportion of septic tanks or pit latrines that are contained and then this is applied to the household questionnaire data on containment types.
- **Validate other data:** Similar to data informing ratios or assumptions, non-representative data may also be used to validate or confirm the responses from other data sets but not necessarily be used in the analysis. This could be to validate accuracy of responses, for example household inspections can confirm household questionnaire responses on sanitation type or treatment inspections can validate local government survey data.
- **Inform sampling frame:** Household or administrative sources conducted at a large scale may be useful to inform the sampling frame for inspections or service provider surveys. For example, the

household questionnaire or service administrator surveys could ask which emptying service provider was used, which then informs the sampling strategy of the service provider surveys. Household questionnaires could also ask whether the containment was accessible which could inform the sample size needed for inspections to ensure an adequate sample of accessible tanks.

- **Units to combine data:** Some questions may be included for the purpose of having a key that can be used to join different data sets. For example the household surveys may ask about who provides the emptying service (e.g. government, private, informal), and although this data is not needed for the indicators, it provides a key to match the data from service providers. Combining data is detailed further below.

E.2.3 Nationally representative data for national estimates

Deciding which data source to use for different purposes should also consider the sampling method of that data, such as whether the data is nationally representative with regards to population groups, geographical areas and coverage. The JMP will include datasets in its database when they represent at least 20% of the population of interest.[2] Understanding the reliability and quality of different data sources is also important, as often one data source needs to be selected as the more reliable one that the other will be updated to match if there are differences. This may vary between indicators, for example household questionnaire responses are considered reliable for data on use of shared facilities but less reliable than household inspections for assessing the type of sanitation facility and containment. The expected reliability of different sources is indicated by shading in table E4. The 2017 JMP methodology update provides an explanation of data acceptance and examples of why some datasets (or particular questions within datasets) are excluded from use in estimates.[2]

E.2.4 Analysis of household scale data

Data analysis for household questionnaires should follow standard practices and guidance for data processing and analysis used by the National Bureau of Statistics and international survey programs.[3] Nationally representative surveys implemented by statistical agencies are the most common source of data for JMP estimates. These often follow approaches of international survey programs such as Multiple Indicator Cluster Surveys (MICS) or Demographic and Health Surveys (DHS) and have been designed with a nationally representative sampling method. Some considerations for analyzing SMOSS indicators from household surveys include:

- **Accurate technology classifications:** There are numerous country specific terminologies to classify sanitation facilities and it is important that there is clear alignment of each facility with the standard categories used in global monitoring. This is important to assess whether the facility is improved but also given assumptions and pathways to SMOSS vary depending on facility type (e.g. assumptions on containment vary for septic tank and pit latrine).
- **Global reporting should be based on core questions only**, and local indicators that include additional expanded questions should be reported separately. Depending on the use of expanded indicators and variation in definition of local indicators compared with the global indicators, it is likely that the estimates will vary which may require careful communication.
- **Assumptions should be recorded and made clear when presenting results**, particularly if they have been updated from global assumptions due to availability of local data.

[2] WHO and UNICEF, 2018. JMP Methodology: 2017 update & SDG baselines. WHO and UNICEF Joint Monitoring Program for Water Supply, Sanitation and Hygiene, p7. Available at: https://washdata.org/report/jmp-methodology-2017-update

[3] For example the MICS guidance on data processing https://mics.unicef.org/tools#analysis

E.2.5 Analysis of non-household data

Non-household data are often collected at different scales and different formats to household questionnaires and may also conclude different findings (especially regarding emptying and disposal rates). While some challenges for the integration of data were discussed in the JMP Task Force on Methods,[4] additional considerations for analyzing non-household SMOSS data and integrating them with household data are presented below.

Transforming administrative data or local government surveys to inform national estimates is more complex than analysis of nationally representative household surveys, as administrative data is often not collected with the intention of statistical analysis. When analyzing non-household data the following aspects should be considered in how this data can inform national estimates:

- **Data captured for subs-sets of the population**. Depending on the sampling unit, administrative data or local government surveys may be large scale and represent the national population or they may be limited to certain population sub-sets. For example, local government may only report on formal hosueholds or registered emptying providers, and therefore miss the informal sectors. Regulatory data may only be available in the service areas of water or wastewater authorities (for example only urban areas), or just the connected customers. Even if the sample is expected to be national, the representation of the reported data may be restricted. For example, the Ecuador survey of municipalities was at a national scale however only service provision in urban areas was reported. Discussions with national stakeholders will be necessary to identify whether this data can be used for national estimates and what additional data can be collected or assumptions made about the populations not covered. UN-Habitat guidance on nationally representative sampling of cities could be applicable to SMOSS.[5]
- **Defining service coverage**: A particular challenge for monitoring sanitation is scaling up data from treatment plants or emptying providers to estimates of the population covered by services. For water supply or wastewater service provision the service area and frequency of service are clearly defined by infrastructure boundaries (location of pipes) and consistent daily services. For on-site sanitation, there is more uncertainty on which area is served as there can be multiple providers serving different or same areas of a city or crossing administrative boundaries to empty or deliver excreta (e.g. sludge emptied in rural areas may be delivered to urban treatment plants). Frequency of provision is also uncertain, as most containments do not need to be emptied every year and therefore the frequency of emptying needs to be considered in analyzing annual emptying or treatment data.
- **Low response rate.** The Ecuador and Serbia SMOSS monitoring pilots both faced challenges with low response rates for either the entire survey or specific questions, while there were limited responses to the service authority surveys in both Nepal and Malawi. Discussions with national stakeholders will be necessary to identify what response rate or representation of the population is acceptable for national estimates. Some countries may have target response rates for national surveys which, if deemed reasonable, should be adopted. Further data collection may be needed to identify if there are trends in the non-responses, for example there is a risk that respondents may not answer rather than report poor quality or missing services.
- **Varied units:** It is likely that data from service providers or service authorities is reported in units other than population and this data will need to be transformed to more comparable units. For

[4] WHO and UNICEF, 2018. WHO/UNICEF JMP Task force on methods. Available at https://washdata.org/report/jmp-methods-task-force-report-final

[5] UN Habitat (2016). National Sample of Cities A model Approach to Monitoring and Reporting performance of Cities at National Level. UN-Habitat, Nairobi. Available at https://unhabitat.org/sites/default/files/2020/06/national_sample_of_cities_english.pdf

example, emptying and transport may be reported as cubic meters of sludge or number of trucks, which will need to be converted to a population or household unit. This requires local data on the size of containers and expected quantity of emptied sludge. Data may also be reported in annual units, which need to be converted to a population equivalent, as emptying is not expected every year. For example, if the national standard is that containments are emptied every 5 years, the number of containments emptied in one year would represent one fifth of the population receiving emptying.

E.2.6 Combining data from different sources

In developing the JMP methods, the taskforce recognized there will be difficulties integrating and combining new data sources, especially when these cannot be linked to individual households and the facilities they use.[4] As there are few examples on the integration of SMOSS datasets, below are strategies drawn from general guidance on use of administrative data to inform national estimates.

- **Integrating datasets** requires common identifiers in both data sets to link through exact matching (e.g. household identification) or a common variable (i.e. administration unit). It is important to consider how these datasets will be linked when designing the data collection methods so that unique identifiers or variables are included in both sources. For example, geographic areas could link administrative data with household surveys if the same geographic categories are included in both sources. Emptying and treatment data could be linked to household questionnaire through a question asking the name or type of emptying provider. While there were no case studies on integrating administrative and household data for SMOSS there are examples from water supply, such as a paper from Ecuador on the integration of household and administrative data on water supply.[6]
- **Alignment and reliability:** Consistency of the data with JMP indicators and definitions needs to be considered when assessing whether a secondary or administrative data source can be used for national SMOSS estimates. A challenge with secondary data from different sources is the potential inconsistency in definitions, terminology or methods that makes comparison with JMP definitions difficult. The JMP suggests that if information from small studies or those conducted by academic institutions or NGOs is to be incorporated into estimates, the data should be verified with the national statistical office.[4]
- **Dealing with non-responses:** A systematic approach should be used to deal with data gaps or non-responses that were common in the Serbia and Ecuador local government surveys. Non-responses can be ignored, assumed consistent with responses or investigated further to establish their characteristics.[7] Given the potential for non-reported data to be due to a lack of service or unsafe services, it is recommended that non-responses are not assumed consistent with responded questions and further surveys, or other methods should be used to investigate further. Otherwise estimations constructed with only the complete data may be biased due to the underlying population.[7]

[6] Moreno, L., Pozo, M., Vancraeynest, K., Bain, R., Palacios, J. C., & Jácome, F. (2020). Integrating water-quality analysis in national household surveys: water and sanitation sector learnings of Ecuador. Npj Clean Water, 3(1), 1-11

[7] FAO, 2018. Guidelines on improving and using administrative data in agricultural statistics. Food and Agriculture Organization, Rome.

There is a growing body of literature on the use of administrative data to inform SDG monitoring given the recognition across many sectors that this can fill gaps in household data or be a more cost-effective approach to collecting data. Some useful references include:

- FAO, 2018. Guidelines on improving and using administrative data in agricultural statistics. Food and Agriculture Organization, Rome. Available at: https://www.fao.org/fileadmin/user_upload/wca/docs/Admin_data_GS.pdf
- Morales, G. & Orrell, T. (2018) Data interoperability: a practitioner's guide to joining up data in the development sector. United Nations Statistics Division (UNSD) and Global Partnership for Sustainable Development Data (GPSDD). https://www.data4sdgs.org/resources/interoperability-guide-joining-data-development-sector
- UN Habitat (2016). National Sample of Cities A model Approach to Monitoring and Reporting performance of Cities at National Level. UN-Habitat, Nairobi. Available at https://unhabitat.org/sites/default/files/2020/06/national_sample_of_cities_english.pdf
- UNICEF (2021). ADaMM: Administrative Data Maturity Model Ver 1.0. UNICEF, New York. Available at: https://data.unicef.org/resources/the-administrative-data-maturity-model-adamm/
- United Nations Economic Commission for Europe (UNECE) (2015). Using administrative and secondary sources for official statistics: A handbook of principles and practices. United Nations, New York and Geneva. Available at Https://unece.org/fileadmin/DAM/stats/publications/Using_Administrative_Sources_Final_for_web.pdf
- UN Women (2019). Advancing administrative sources of data for monitoring gender-specific Sustainable Development Goals in Africa. UN Women, Nairobi. Available at http://africa.unwomen.org/en/digital-library/publications