Annex C: Data collection - Household sanitation inspections

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 C Data collection - Household sanitation inspections

This Annex details the household level sanitation inspections which are direct observations of sanitation facilities to assess risks. This annex provides core questions on containment, expanded questions on facility condition and risk, and real-world inspection examples from countries like Ireland and France. It also includes templates and sampling advice to help countries assess whether sanitation systems are functioning safely.

Inspection of toilets in Bangladesh (left), Zambia (central), Ecuador (right) from Phase 1 Pilots

C. Data collection - Household sanitation inspections

Household sanitation inspections are an observational technical and risk assessment of toilet facilities and containments that can capture more technical details than household questionnaires or can be used to validate what is self-reported by households. Inspections can be implemented as part of a larger household questionnaire or conducted as an independent inspection only survey. Depending on the scope and objective of the household questionnaire, integrating inspections may mean fewer observations can be included and that the enumerator is not necessarily technically trained.

WHO has developed a Sanitation inspections: User Guide that provides tools and examples for applying sanitation inspections in various contexts, including regulatory reporting, household surveys to monitor sanitation progress, and local evaluations of systems sustainability.[1] Much of the information included in this Annex forms part of the user guide.

National sanitation inspections in Ireland and France are conducted with the parallel objectives of monitoring and improving the services by making recommendations based on the observations and developing a plan to follow-up on any of the defaults or risks identified. This may require an expanded scope of inspection to adequately identify what requires improving and how, which is broader than the scope included for global monitoring. Inspections can also be used to assess toilet accessibility, cleanliness, privacy, and presence of handwashing facilities and materials, but this report just focuses on their use in assessing containment.

The proposed core questions in Table C 1 are the minimum needed to inform the global indicators of containment and could be integrated as an observational component into an existing national household survey. The subsequent Table C 2 provides examples of expanded questions that may be useful to assess additional risks or function of sanitation facilities. This is not a comprehensive list of all possible expanded questions but instead provides an example of questions tested from the phase 1 pilots, particularly Indonesia, Bangladesh and Serbia, and also drawn from the WHO sanitation inspection forms. Further details on the household sanitation inspections conducted during the pilots and lessons from their implementation are described in the Phase 1 synthesis report.

C.1 Core questions – household sanitation inspection

Table C 1. Core questions for household sanitary inspections

ID	Core inspection question	Responses	Indicator	Skip
IH1	Observe the type of sanitation facility.	Observation possible, containment type is: 11. Flush to piped sewer system 12. Flush to septic tank 13. Flush to pit latrine 14. Flush to open drain 15. Flush to covered drain 18. Flush to don't know where 21. Ventilated improved pit latrine (with slab) 22. Single pit latrine with slab 23. Twin pit latrine with slab 24. Pit latrine without slab /Open slab 31. Composting toilet	S1, S2, S3, S6, S6, S7.	IH1(11,14, 15, 18, 41,51,95) > end (Note: inspection for on-site sanitation facilities only)

[1] WHO (2024) Sanitation inspections: User guide. World Health Organization and UNICEF, Geneva. https://www.who.int/publications/m/item/sanitation-inspections--user-guide

ID	Core inspection question	Responses	Indicator	Skip
		32. Container based sanitation 41. Bucket 51. Hanging toilet/hanging latrine 95. No facility/bush/field 96. Other (specify) 97. Observation not possible		IH1(21,22, 23,24,31,3 2)>IH5
IH2	Does the containment (tank or pit) have an outlet pipe for liquid effluent? (Only asked to wet containments - those replying IH1(12,13,96)) *Prompt: outlet is an external pipe through which liquid effluent from the containment is discharged*	1. Yes 2. No (includes those infiltrating from base of tank/pit to ground) 7. Unable to observe	S10	IH2 (2,7) >IH4
IH3	If the containment has an outlet pipe for liquid effluent (yes to IH2), where does this pipe discharge?	1. To a leach field, soak pit 2. Sewer/closed drain to a wastewater treatment plant (WWTP) 3. Sewer/closed drain to a waterbody (not connected to WWTP) 4. Sewer/closed drain to don't know where 5. To an open drain 6. To a waterbody/surface 8. Other 9. Don't know	S10	
IH4	Observe if there are other visible problems with the facility causing excreta to not be contained? *(The following questions relate to all on-site systems, S01a=12,13,21,22,23,24,31,32)*		S10	
IH4a	Overflow of excreta to the surface and surroundings	1. Yes 2. No 8. Don't know		
IH4b	Flooding resulting in release of excreta to surface and surroundings	1. Yes 2. No 8. Don't know		
IH4c	Containment collapse resulting in release of excreta to the surface and surroundings	1. Yes 2. No 8. Don't know		
IH4d	Other events resulting in release of excreta to the surface and surroundings	1. Yes 2. No 8. Don't know		
IH5	If observation not possible (IH1=97 or IH2=7), please indicate why	*Select all that apply:* A. No permission to observe sanitation facility B. Unable to access sanitation facility C. Unable to assess containment D. Other (specify)		

C.2 Example expanded questions for household sanitation inspections

The core indicators are the minimum required to assess the global indicators, however other data can be captured to further assess the features of on-site facilities, any functional issues or potential health risks through expanded questions. The list below is compiled from the WHO sanitation inspection forms (see section 3.3.1 below) and the phase 1 country pilots in Indonesia (IDN), Serbia (SRB) and Bangladesh (BDG). Further examples of inspection questions or indicator from global examples are presented in the following section.

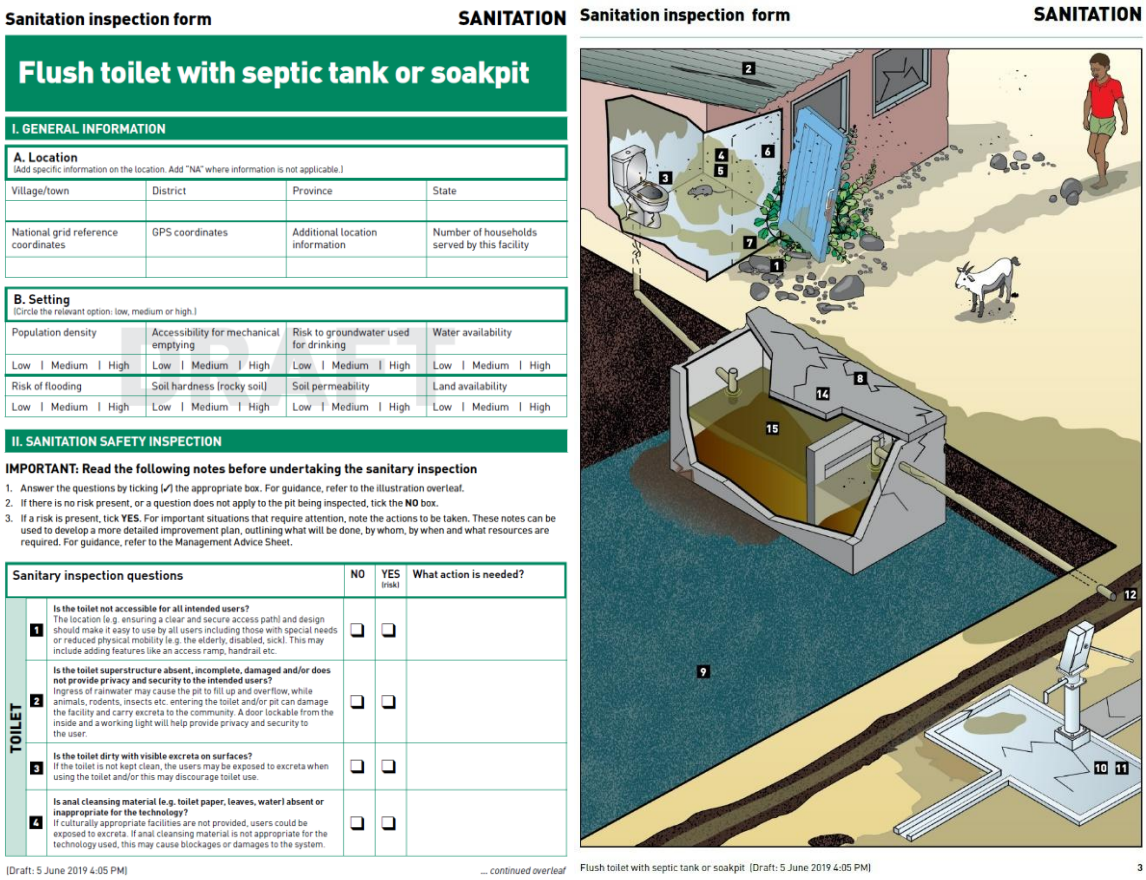
Table C 2. Example expanded questions for household sanitation inspections

	TOILET FACILITY AND ACCESS
Structure	WHO. Is the toilet superstructure absent, incomplete, damaged
	BGD/SRB. Are 'the walls' and/ or "the door" of the toilet in place?
Privacy and security	WHO. Does the toilet superstructure provide privacy to the intended users?
	WHO. Does the toilet superstructure provide security to the intended users?
Cleanliness	WHO. Is the toilet dirty with visible excreta on surfaces?
	BGD/SRB. Is the toilet free from faecal smears on pan, wall and floor?
	BGD/SRB. Is the toilet pan free from used cleaning materials? (paper, stones and sticks)
	CONTAINMENT
Construction	IDN. What is the material used for containment wall?
	IDN. What is the material used for containment bottom/base?
	SRB/BGD. Can (ground) water get in or out of the pit/septic tank? (so the pit/septic tank is not "water tight or sealed")
Design and function	IDN. What is the dimension of the containment? a) Rectangular (LWD) b) Circle (Dia, D) c) Other
	SRB/BGD. What is the capacity of the containment facility? (cubic meters)
	WHO. Are there excreta overflowing from the squat hole, pan or pedestal?
	WHO. Are there ponds of effluent visible on the ground outside the toilet?
	WHO. Is the pit poorly maintained such that the cover slab is cracked or damaged?
	WHO. Is the pit poorly maintained such that the side walls are not stable?
Ground-water risk	IDN. Estimate the distance between containment and nearest groundwater source
	BGD/SRB. How deep (meters) is the latrine pit or septic tank below the ground surface? Note: The depth could be measured or estimated, source of data should be noted)
	What is the depth to groundwater? Measure open well if possible, if not request household estimate of the groundwater level?
	WHO B7. Soil permeability: How easily water drains or seeps into the soil?
	EMPTYING
Emptying method and access	BGD/SRB. Where is the sanitation facility located?
	IDN. Estimate the width of the road
	WHO. Accessibility for mechanical emptying - The ease with which a service provider could remove sludge using a pump or gulper device
	OTHER RISKS
Risks related to the surrounding environment	WHO B1. Population density: For the neighbourhood or area immediately around the toilet, how closely together are people living
	WHO B5. Risk of flooding: How frequent and severe are floods that could damage sanitation facilities

C.3 Sanitation inspection form examples

C.3.1 WHO Sanitation inspection forms

WHO developed sanitation inspection forms for seven types of sanitation systems.[2] They include a short-standardized observation checklists that can be adapted and used by stakeholders to assess risk factors at or near sanitation facilities and identify appropriate actions to safeguard public health (WHO 2019). The checklist is accompanied with a graphic to support the identification of different risks, with the flush toilet to septic tank inspection form shown below. The sanitation inspections are complemented by a set of management advise sheets which provide guidance on operation and maintenance of sanitation systems and possible remedial actions for the risks identified. This rectification assessment would be more suited to an independent sanitary inspection than one integrated within a broader household survey that typically does not discuss the results of the monitoring.



Sanitation inspection form — SANITATION

Flush toilet with septic tank or soakpit

I. GENERAL INFORMATION

A. Location
(Add specific information on the location. Add "NA" where information is not applicable.)

Village/town	District	Province	State
National grid reference coordinates	GPS coordinates	Additional location information	Number of households served by this facility

B. Setting
(Circle the relevant option: low, medium or high.)

Population density	Accessibility for mechanical emptying	Risk to groundwater used for drinking	Water availability
Low I Medium I High	Low I Medium I High	Low I Medium I High	Low I Medium I High
Risk of flooding	Soil hardness (rocky soil)	Soil permeability	Land availability
Low I Medium I High	Low I Medium I High	Low I Medium I High	Low I Medium I High

II. SANITATION SAFETY INSPECTION

IMPORTANT: Read the following notes before undertaking the sanitary inspection

1. Answer the questions by ticking [✓] the appropriate box. For guidance, refer to the illustration overleaf.
2. If there is no risk present, or a question does not apply to the pit being inspected, tick the **NO** box.
3. If a risk is present, tick **YES**. For important situations that require attention, note the actions to be taken. These notes can be used to develop a more detailed improvement plan, outlining what will be done, by whom, by when and what resources are required. For guidance, refer to the Management Advice Sheet.

		Sanitary inspection questions	NO	YES (risk)	What action is needed?
TOILET	1	**Is the toilet not accessible for all intended users?** The location (e.g. ensuring a clear and secure access path) and design should make it easy to use by all users including those with special needs or reduced physical mobility (e.g. the elderly, disabled, sick). This may include adding features like an access ramp, handrail etc.	❑	❑	
	2	**Is the toilet superstructure absent, incomplete, damaged and/or does not provide privacy and security to the intended users?** Ingress of rainwater may cause the pit to fill up and overflow, while animals, rodents, insects etc. entering the toilet and/or pit can damage the facility and carry excreta to the community. A door lockable from the inside and a working light will help provide privacy and security to the user.	❑	❑	
	3	**Is the toilet dirty with visible excreta on surfaces?** If the toilet is not kept clean, the users may be exposed to excreta when using the toilet and/or this may discourage toilet use.	❑	❑	
	4	**Is anal cleansing material (e.g. toilet paper, leaves, water) absent or inappropriate for the technology?** If culturally appropriate facilities are not provided, users could be exposed to excreta. If anal cleansing material is not appropriate for the technology used, this may cause blockages or damages to the system.	❑	❑	

(Draft: 5 June 2019 4:05 PM) ... continued overleaf

Sanitation inspection form — SANITATION

Flush toilet with septic tank or soakpit (Draft: 5 June 2019 4:05 PM) 3

Figure C1. WHO Sanitation inspection form – Flush toilet to septic tank (WHO, 2019)

C.3.2 Ireland – EPA inspection of Domestic Waste Water Treatment Systems (DWWTS)

The EPA is required to implement a national inspection plan for Domestic Waste Water Treatment Systems (DWWTS, also known as septic tank systems) including 1000 inspections conducted per year. The inspections are divided between local authorities based on a risk assessment considering environmental, water quality and human health risks. They are carried out by local authority inspectors appointed by the EPA following specific training. The inspection program is coupled with awareness raising and engagement so that households understand the risks and know how to ensure their systems are

[2] WHO (2019) Sanitation inspection forms available at https://www.who.int/teams/environment-climate-change-and-health/water-sanitation-and-health/sanitation-safety/sanitation-inspection-packages

operating correctly. Inspected households receive a report and advisory notice if remedial actions are required, which are then followed up on.

Information is also available on the "What to expect from a septic tank inspection" leaflet which is available for download at the following link *http://www.housing.gov.ie/sites/default/files/migratedfiles/en/Publications/Environment/Water/FileDownLoad%2C33590%2Cen.pdf*
There is also a video available outlining what to expect from an inspection at the following link *http://www.epa.ie/water/wastewater/guidance/whattoexpectfromaninspection/*

Complete inspection forms are shared online, with the key areas the inspections assess including:

- the system is registered with Protect Our Water;
- the system is not leaking;
- waste water is not ponding on the surface;
- the system is not piped directly to surface water (which requires a license);
- rainwater or surface water from yards is not entering the system;
- the system is being properly maintained;
- the system is been emptied (de-sludged) at appropriate intervals; and
- the system does not affect human health or the environment.

The 2020 report summarised the reasons for DWWTS failure, the most common were: not being maintained (39% of inspected systems), not desludged (24%), leaking (16%), discharging illegally to stormwater drains (15%), effluent ponding (12%) and rainwater ingress (10%). Full details in Domestic Waste Water Treatment System Inspections 2020.

C.3.3 France Assessment of non-collective sanitation services

Since 1992 the communes in France are responsible for installations of on-site sanitation (non-collective sanitation). They created a dedicated service for the management of this - les Services Publics d'Assainissement Non Collectif (SPANC) – who has the mission to verify the good implementation of new and rehabilitated systems as well as their function and maintenance. Communes must monitor the existing sanitation systems and provide permits for new systems. Existing systems were required to all be monitored once before 2012, then once every 10 years after that. This data is submitted by the municipalities to an online data portal SISPEA (Information System on Public Water and Sanitation Services/Système d'Information sur les Services Publics d'Eau et d'Assainissement). This portal is managed by the French Office for Biodiversity (Office Français de la Biodiversité).[3]

For the case of verification of function of existing non-collective sanitation facilities, all systems should be inspected once every 10 years, and when properties are transferred. Households are provided notice of the upcoming inspection and pre-complete an initial form D1 that provides background details on the containments use, age, etc. The SPANC inspector then conducts the inspection, filling out form D2 with details on the site, conducting a detailed inspection of all parts of the on-site sanitation system, a risk assessment and final assessment of compliance.

The main points to assessed include[4] :

- the existence of a complete installation;

[3] Source : https://www.services.eaufrance.fr/donnees/telechargement

[4] see page 28 of SPANC 2014 Assainissement non collectif Guide d'accompagnement des services public de l'ANC: Outil d'aide au contrôle. http://www.assainissement-non-collectif.developpement-durable.gouv.fr/IMG/pdf/12032-2_ANC_Guide-SPANC_complet_monte_2014_cle7a9567.pdf

- adapting the sizing of the installation;
- the absence of major malfunction of the installation;
- the absence of possible direct contact with untreated wastewater;
- the absence of risk of disease transmission by vectors for mosquito control areas;
- the safety of the facilities (in particular the structure and closure of parts of the facility that may present a danger to the safety of persons);
- the collection of all wastewater for which the installation is intended, to the exclusion of all others and that other water, in particular rainwater and swimming pool drain water, is not directed there;
- the proper flow of collected wastewater to the treatment device and until its evacuation, the absence of stagnant water on the surface and the absence of superficial flow and runoff towards neighbouring land;
- the operating condition of the devices and regular maintenance on the basis of the documents attesting to this in accordance with the conditions of use mentioned by the manufacturer (user guide, technical data sheets);
- regular maintenance of the facilities in accordance with the texts in force: accumulation of grease and floating materials in the facilities, sludge level, cleaning of grease traps and pre-filters (in the event that the SPANC has not taken on the competence maintenance or outside the user's request);
- the carrying out of emptying by an approved person, the frequency of evacuation in relation to the guides for the use of emptying materials and the destination of the latter with presentation of supporting documents;
- cleaning of pipes (excluding underground spreading) and devices, if applicable;
- the condition of the devices: defects related to wear (cracks, corrosion, deformation).
- the location of the installation with regard to sensitive uses (minimum distance of 35 meters from private wells, compliance with easements linked to the perimeters of protection of water catchments, etc.);
- the possible redevelopment of the land on and around the facility;
- the possible location of the installation in an area with environmental challenges or with health issues;
- compliance with the conditions for implementing the installation devices in accordance with the reference documents (trade rules, approvals);

A detailed description of the indicators collected is available at https://www.services.eaufrance.fr/indicateurs/assainissement-non-collectif as well as in the spreadsheets including annual data https://www.services.eaufrance.fr/donnees/telechargement

C.3.4 Japan Johkasou annual inspection

Johkasou are decentralised wastewater systems that serve households not connected to sewer networks. They are prefabricated tanks that treat household blackwater and greywater through anaerobic filtration and contact aeration processes. All Johkasou systems are required to have an annual “legal inspection” to confirm if the maintenance and desludging are done appropriately and the treatment performance is adequate. This flyer shows the various stages of operation, maintenance and inspection and responsibility for each: https://www.env.go.jp/recycle/jokaso/basic/pamph/pdf/wts_13.pdf

Annual inspections are required to confirm if the maintenance and desludging is done appropriately, and the treatment performance is adequate. The inspections are conducted by trained Johkasou inspectors, of which there were 1280 inspectors and 65 Specified inspection agencies in 2015, who registered under the Enforcement regulations of Johkasou Act. http://www.wepa-db.net/activities/2013/20130218-19_4th_wiw/pdf/1_3.pdf

The areas covered in the annual inspection include[5]:

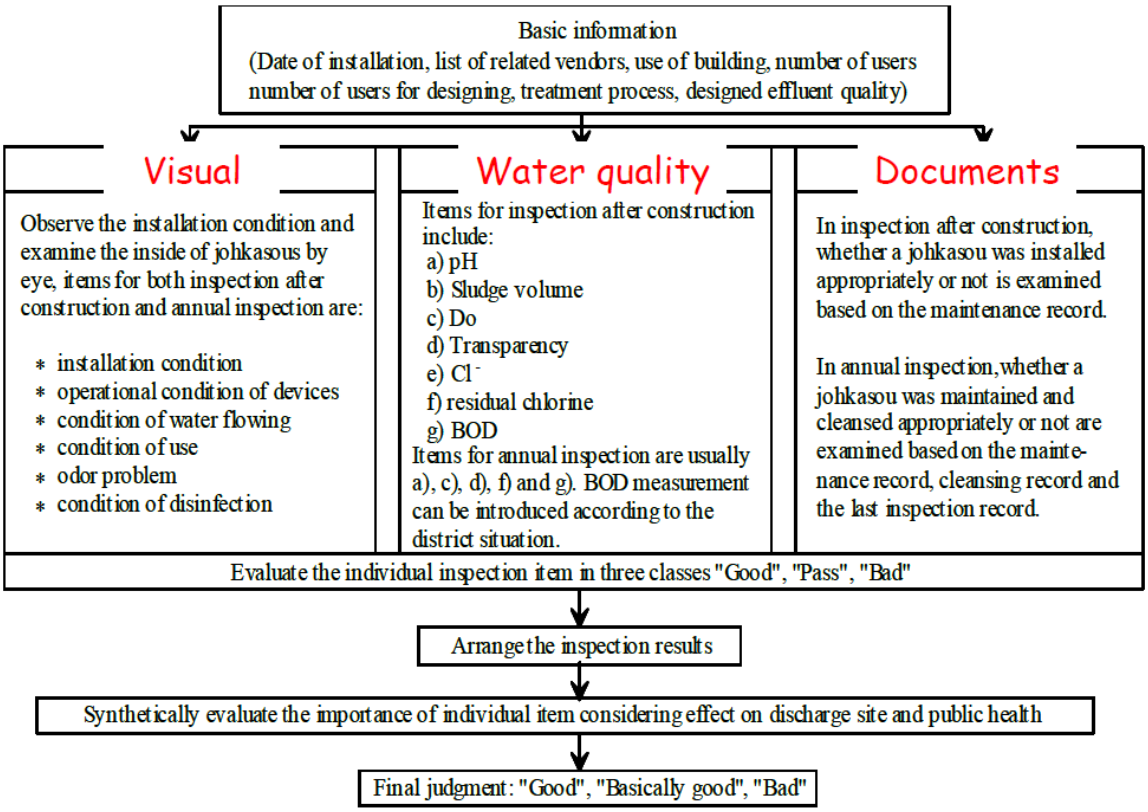


Figure C2. Johkasou decentralized treatment inspection approach

C.4 Sampling for household sanitation inspections

The sampling approach for household inspections depends on whether the data is to be used as a primary source, to develop national assumptions or validate household questionnaire responses. For data to be a primary source then a larger sample size is necessary, such as could be achieved when integrated with household questionnaires. For integrated surveys, it may be suitable to inspect a portion of the surveyed households if it is assumed that there is little variation between households in the same area. For example, in the phase 1 pilot in Bangladesh, inspections were conducted for one third of surveyed households (959 inspections of 3149 household surveys). The variability of inspection data has not yet been analysed to inform calculation of a statistically appropriate sample size for inspections integrated into larger household surveys.

For dedicated surveys there is also a knowledge gap of the suitable sample size, particularly for using inspection data to inform national estimates. The frequency that the surveys would be required is also unknown, as it can be expected that changes in physical features of sanitation facilities may change less frequently that access and sharing. There does not appear to be a systematic way in which the sample sizes were chosen for the Ireland annual monitoring (1000 per year) or the French interval between monitoring (once every 10 years). The Irish example however did have a systematic approach to

[5] Source: https://moam.info/effective-japanese-domestic-wastewater-treatment-ubm-asia_59f5a8bb1723dd1a3a4a6a92.html

stratifying samples, with sampling prioritized in areas identified as higher risk of groundwater contamination.

Another consideration for determining the sample size is the acceptance rate as the enumerator may be required to enter or pass through the property to conduct the inspection, requests to inspect the inside of containments or measure sludge depth may be even more difficult. In Indonesia the pilot targeted 55 households and only 14 households permitted the containment be opened for inspecting and measuring sludge depth. Of these 14, only 4 were accessible, located in the yard and with a lid or other opening to permit inspection. In Bangladesh inspection inside the tank was only feasible for two thirds of inspected households, with a particular challenge being the opening of heavy containment lids with just one enumerator.

Lastly, inspections done in response to reported problems or non-compliance are difficult to use for national estimates as they only sample a sub-set of the population that is not representative of the containments without issues.

Table C 3. Global national monitoring examples

	Sanitation inspections	Stratification	On-site sanitation population
Ireland	1000 / year	Based on hydrogeology and increased sampling in zones at high risk of contamination	Ireland's population was 4.9 million in 2020 with 25% of the population using septic tanks, 7% latrines.
France	Once every 10 years and all new properties or property transfers. Some may require more frequent control (high risk to health and environment or if requires regular maintenance).	All on-site sanitation systems	France's population in 2020 was 65 million, with 18% of the population using septic tanks
Japan	Annual "legal inspection"	Johkasou decentralised wastewater systems	JMP 2019 data indicates 19% of the population use septic tanks. In 2011 annual Johkasou inspections occurred for 45-50% of facilities, while 93% of new facilities were receiving initial performance inspection after construction