Household container based sanitation in Emergencies

The iHUD (in-home urine diversion) is a dry, rapidly deployable, self contained, container based toilet (CBT) that provides individual household level sanitation access from the first phase of an emergency. The iHUD can provide a solution for people with special needs (PSNs) who cannot access communal or external household toilets, it may be a preferable option to women and children who do not feel safe using public or communal toilets, particularly at night or it could be appropriate in difficult ground conditions or congested areas where it is not possible to construct semi permanent toilets of dispose of waste in situ. Critical to the success of CBTs is safe disposal of waste and this needs to be planned prior to introducing iHUD toilets. As with any sanitation solution, consultations should take place with intended beneficiaries to ensure it is acceptable and meets their needs.

Treatment technology:	Containment only, emptying toilet and offsite disposal is required.
Treatment objective	n/a
Treatment capacity	Toilet is designed for a single household use with emptying twice per week (minimum). Capacity of urine tank – 24 litres, solid waste vessel – 7 litres
Site requirements	The iHUD is portable so theoretically does not require a superstructure. A dedicated space – such as a toilet or bathing structure - is preferred for privacy, hygiene and odor management, similar to a toilet or bathing superstructure but this could be another space within or immediately outside the shelter or dwelling. Requirements will depend on cultural norms, privacy and preference of different users.
Life expectancy	Up to 3 years (to be determined based on field testing)
Weight and volume	5.5kg, 38cm (H), 39cm (W), 42cm (D) Toilet base and lids are stackable and bodies partially next for efficient transport and airfreight
Start up time	Ready to immediate use
Capital cost	$55 (estimated production cost for Nairobi, Kenya).
Operational cost	Variable, if self managed, there is no direct operational costs. A service collection model needs to consider costs of waste collectors, transport, treatment, disposal, processing costs considering SOPs to ensure manage contact with waste (e.g. Personal Protective Equipment)
Equipment overview	Toilet comprises four components 1) body, 2) lid (1 & 2 both injection molded), 3) urine tank (roto molded), 4) faeces vessel (currently consisting of section of 6 inch pvc pipe) and plastic bag (alternatively a re-usable plastic container can be used). The body rests on the urine tank which is used to transport urine to the point of disposal. To enable uninterrupted use, a second urine tank for each toilet may be required, which increases the cost of each toilet to $79.  Toilet cross-section

Process overview	Where IHUD toilets are deployed on a small scale it may be possible for users to self manage and be responsible for safe disposal of waste. For PSNs this would require a carer to take the waste and dispose of in the nearest toilet. As numbers increase, risks and consequences of exposure to waste increase through spillage or irresponsible/indiscriminate disposal. Therefore the need for a systematic, controlled process increases, which can better be managed through a dedicated sanitation service provider following an agreed set of standard operating procedures. This can become an expensive and logistically complicated process so needs to be fully considered as part of any decision to introduce container based toilets. Waste collection and management can become very cost-efficient with a dense network of toilets. Experience from Kenya indicates that minimum emptying of twice per week is required to avoid overflowing and manage smell.
Additional considerations	- CBS is a relatively new and untested concept to humanitarian contexts and at the time of writing had not been applied and proven at scale. - Long term operation costs need to be factored in from the start as if an external servicing model these recurrent are significant. - CBS is premised on the basis of safe collection and disposal of waste at designated sites. If this is compromised CBS could contribute to a disease outbreak. With a servicing model, SOPs can be put in place and monitored (subject to funds), where individual households are responsible, strong community mobilization is required.
Advantages over other toilet options	- No excavation required so particularly suited for difficult ground conditions (rocky, flood prone, collapsible soils). - Suitable in high density urban areas or camp setting where there is insufficient space to build latrines or where there are restrictions in place to build sanitation infrastructure or dispose of human waste in situ. - Arguably the quickest solution to reach household sanitation coverage in an emergency, so potentially mitigates protection risks and addresses needs of women and girls who in high numbers consistently do not feel safe assessing standard camp toilets (this is an assumption that needs confirming through community consultation on a case by case basis). - CBS and separation of liquid and solid waste at source lend themselves to situations were waste to value initiatives are being considered (e.g. organic compost or briquettes)

CAD images of final iHUD design, production due September 2019