

## Methodological Note – Calculation of COVID-19 Incidence Risk

This methodological note explains how the 2020 **COVID-19 Incidence Risk** each district in Yemen were calculated for the COVID-19 Incidence Risk Map, conducted by REACH on behalf of the Yemen WASH Cluster (YWC). The Incidence Risk was calculated using six indicators, described in more detail in the following sections:

1. Population density
2. Proportion of IDPs over total population
3. WASH Severity Score
4. Health Severity Score
5. GAM Severity Score
6. Cholera Severity Score

Since the calculations were not linked to a single statistically representative survey and there are some information gaps in the reviewed literature, the severity scores should be considered as indicative estimates.

### 1. Population Density

UN OCHA data for district population and district area were used to determine population density. Total population was divided by square kilometres to determine density. Any district with less than 1 person per square kilometre was assigned a severity score of 0. The remaining districts were divided into six equal groups and assigned categories where 1 represents the districts with the lowest population density and 6 represents those with the highest population density. See Table 2 for Ranges.

### 2. Proportion of IDPs over Total Population

The proportion of IDPs over total population is included in the COVID-19 Incidence Risk as a proxy for vulnerable populations/populations with protection concerns. The figures were obtained from the WASH SDR 2020. The population figures are based on OCHA's 2020 population estimates. The severity scores for each district were assigned based on previous Shelter Cluster categories, described in Table 2.

### 3. Determination of Core WASH Severity Score at District level

The determination of WASH severity scores at district level is based on an adaptation of the [Secondary Desk Review of WASH Assessments in Yemen 2020](#). Table 1 describes the core WASH Indicators that make up the WASH Severity score used in the COVID-19 Incidence Risk. For a full description of the calculation of each indicator and the Core WASH Severity Score, please see the *WASH SDR Methodology Note*.

Table 1 Indicators comprising the Core WASH Severity Score; analysis conducted during the SDR of WASH Assessments in Yemen 2020 (REACH)

Consequence	Indicator	Sub-Indicator	Source
Core WASH Indicators	Access to an improved water source	% Households reporting accessing an improved primary water source for drinking water in the past 30 days	YWC SDR
		% Households reporting water collection time does not exceed 30 minutes for a round trip, including queuing	YWC SDR
	Access to minimum water quantities needed	% Households reporting having more than 50 litres of water per person per day or being connected to a piped system	YWC SDR
	Access to functional and improved sanitation facilities	% Households reporting use of improved sanitation facilities	YWC SDR
		% Households accessing clean and functional latrines	YWC SDR
	Access to adequate environmental sanitation	% Households who did not witness visible wastewater in the vicinity (30 metres) of their shelter in the last 30 days	YWC SDR
		% Households whose garbage is being collected through public system	YWC SDR
	Access to functional handwashing facilities and soap	% Households having handwashing facilities with water and soap	YWC SDR

### 4. Health Severity Score

The Health Severity Score was obtained from the Health Cluster – these scores were used to inform the interim HNO for Yemen in 2020. The Health Cluster Severity Score should represent relative access to health services and differing severity of health needs across districts, however the exact method of calculating the score is unknown at this

time. If GAM and/or Cholera Severity Scores are incorporated in the calculation, these two variables may be more heavily weighted than expected. However, like COVID-19, these two indicators are infectious diseases highly influenced by WASH access and therefore may be the most relevant indicators.

### 5. GAM Severity

Data for informing the indicator in GAM was directly obtained from the Yemen Nutrition Cluster. Both rates for GAM per district as well as the Severity Scale for classifying these GAM rates were provided by the Yemen Nutrition Cluster. There is no “2” categorization for this indicator because the Nutrition Cluster determined that relatively low rates of GAM merited high need classifications – we have decided to continue using the Nutrition Cluster scale for the sake of consistency and data comparability.

### 6. Cholera Severity

Data for informing the indicator in Cholera Attack rates were directly obtained from the Yemen Health Cluster. Attack Rates per district were calculated based on the number of reported suspected cholera cases or AWD cases per 10,000 population. Also the Severity Scale for classifying Cholera Attack Rates were provided by the Yemen Health Cluster, as well as Severity Scores based on these attack rates for all of the Yemeni districts.

**Table 2: Indicator List for COVID-19 Incidence Risk Mapping**

Nr	Indicators	No need for external humanitarian assistance		Need for humanitarian assistance		Acute and immediate need for humanitarian assistance			WEIGHT
		0	1	2	3	4	5	6	
		Minimal severity	Minor severity	Moderate severity	Significant severity	Major severity	Severe severity	Critical severity	
1	Population density - person per square kilometer	<1 person per kilometer	1-27 people per kilometer	28-74 people per kilometer	75-187 people per kilometer	188-318 people per kilometer	319-517 people per kilometer	>517 people per kilometer	30%
2	Proportion of IDPs over Total Population	Normal situation. No IDPs	IDPs constitute (>0%, <4%) of population	IDPs constitute (>=4%, <7%) of population	IDPs constitute (>=7, <10%) of population	IDPs constitute (>=10, <12%) of population	IDPs constitute (>=12, <16%) of population	IDPs constitute (>=16%) of population	10%
3	WASH Severity Score (Combined/Mixed Populations)	90%-100% have access	75%-89% have access	60%-74% have access	45%-59% have access	30%-44% have access	15%-29% have access	0%-14% have access	20%
4	Health Severity Score	NA	NA	NA	NA	NA	NA	NA	20%
5	GAM Severity Score	GAM is 0%	GAM is between 0.1% and 4.9%	NA	GAM is between 5 and 9.9%	GAM is between 10 and 14.9%	GAM is between 15 and 19.9%	GAM is 20% or more	10%
6	Cholera Severity Score	Suspected cholera cases/AWD is 0 per 10,000 population	Suspected cholera cases/AWD is between 0 and 0.9 per 10,000 population	Suspected cholera cases/AWD is between 1 and 9.9 per 10,000 population	Suspected cholera cases/AWD is between 10 and 99 per 10,000 population	Suspected cholera cases/AWD is between 100 and 199 per 10,000 population	Suspected cholera cases/AWD is between 200 and 499 per 10,000 population	Suspected cholera cases/AWD is 500 or more per 10,000 population	10%
<b>Total</b>									<b>100%</b>