

Needs Analysis Working Group

-Vulnerability Risk Framework-

21 April 2020

Agenda

1. Review updated framework for validation
 - a) Review of limitations
2. Review and discuss high-risk counties

OBJECTIVES:

- Validate updated Vulnerability Framework
- Finalize and validate list of highest-risk counties for recommendation to ICCG and NTF

Vulnerability Analysis Framework: Risk of Entry / Spread

Type of Vulnerability	Category	Indicator	Rationale/Comments	Proposed weights and thresholds		Data sources
Risk of entry and spread of virus	High levels of population movement	# of individuals reported arriving from neighboring countries/camps within the last month # of individuals reported arriving from COVID affected district in neighboring countries/camps within the last month	Migration from neighboring countries with confirmed COVID-19 cases may increase the risk for cross-country transmission	1.5	>= 50 and <150 individuals ¹ arriving from neighbouring countr(ies) per month	IOM Flow Monitoring REACH PRM UNHCR Flow Monitoring, UNICEF caseload data
				3	>= 150 individuals arriving from neighbouring countr(ies) per month	
				4.5	>= 15 and <150 individuals ² arriving from COVID-affected areas in neighbouring countr(ies) per month	
				6	>=150 individuals arriving from COVID-affected areas in neighbouring countr(ies) per month	
	Population density	Presence of IDP/Refugee sites (not in host community)	Informal camps, IDPs/Refugees not integrated in the host community. IDPs/Refugees living in camp-like or informal settings are considered more vulnerable due to the poor and concentrated living conditions, which may increase the rate of COVID transmission in those populations.	0.5	>=2,000 and 5,000	CCCM Cluster – Camp-like settings in SSD; UNHCR
				1	>=5,000 and <=20,000	
				1.5	>20,000 and <=55,000	
				2	>55,000	
		Presence of large urban centres	Large urban centres may lead to increased transmission given they are often key transit hubs, markets, and have high population density.	0	<100,000	European Commission Global Human Settlement Layer
				1	>=100,000 and <=250,000	
				2	>250,000	
		Avg. # people / km ²	Increased population density may lead to increased transmission; consider urban centres and POC sites	0.25	>50 th to 75 th percentile	OCHA COD-PS
				0.5	>75 to 90 th percentile	
				0.75	>90 to 95 th percentile	
				1	>=95 th percentile	
		Household size	Counties with larger household size may have higher likelihood for increased transmission due to closer proximity of household members	0	Avg. HH size is below the 50 th percentile of national average	FSNMS Round 25 data ³
				0.5	Avg. HH size is in the 50-75 th percentile of national average	
				1	Avg. HH size is in the 75-100 th percentile of national average	

¹ Median number of individual arrivals into counties in South Sudan from neighbouring countries per county was 91.5 in March 2020.

² Median number of individual arrivals into counties in South Sudan from confirmed COVID-affected areas in neighbouring countries per county was 14 in March 2020. It is noted that this number will likely increase as COVID spreads, so this threshold may fluctuate.

³ FSNMS is representative of rural areas only

Vulnerability Analysis Framework: Intersectoral Vulnerability

Intersectoral Vulnerability (Risk of severity of the outbreak - known factors which could increase the proportion of severe COVID cases in an area)	Population density	Presence of IDP/Refugee sites (not in host community)	Informal camps, IDPs/Refugees not integrated in the host community. IDPs/Refugees living in camp-like or informal settings are considered more vulnerable due to the poor and concentrated living conditions, which may increase the rate of COVID transmission in those populations.	0.5	>=2,000 and 5,000	OCHA – Camp-like settings in SSD; UNHCR	
				1	>=5,000 and <=20,000		
				1.5	>20,000 and <=55,000		
				2	>55,000		
		Presence of large urban centres	Large urban centres may lead to increased transmission given they are often key transit hubs, markets, and have high population density.	0	<100,000	European Commission Global Human Settlement Layer	
				1	>=100,000 and <=250,000		
				2	>250,000		
		Avg. # people / km ²	Increased population density may lead to increased transmission; consider urban centres and POC sites	0.25	>50 th to 75 th percentile	OCHA COD-PS	
				0.5	>75 to 90 th percentile		
				0.75	>90 to 95 th percentile		
		Household size	Counties with larger household size may have higher likelihood for increased transmission due to closer proximity of household members	1	>=95 th percentile	FSNMS Round 25 data	
				0	Avg. HH size is below the 50 th percentile of national average		
				0.5	Avg. HH size is in the 50-75 th percentile of national average		
		Demographics	Avg. # of elderly (60+) in the HH	Due to elderly vulnerability to COVID	1	Avg. HH size is in the 75-100 th percentile of national average	FSNMS Round 25 data WFP Urban Demographics Data (only Wau, Juba, and Bor, 2017)
					0	<0.69	
	2				>=0.7 and <0.89		
	High food insecurity	% of HHs by IPC Phase classification from Projection 1 (Feb – April 2020)	Greater food insecurity means a greater likelihood of reduced quantity or quality of the household diet, which could lead to a weakened immune system. Food insecurity, reliance on GFD can reduce immunity	0	>= 0.9	IPC South Sudan Jan 2020	
				1	P3 < 20%		
				2	P3+ >=20% AND P3+ <50%		
				3	P3+ >= 50%		
			4	P3+ >= 75% OR P4+>= 20%			
				4	P5>0 OR P4+>= 30%		
		% of HH reportedly main source of food is markets in lean season	Households that are dependent on markets for their main food source may be unable to access food as prices increase from border closures. Greater food insecurity may lead to weakened immune system.	2	if >30% in lean season	FSNMS Rd 24	

Vulnerability Analysis Framework: Intersectoral Vulnerability (cont'd)

Intersectoral Vulnerability (Risk of severity of the outbreak - known factors which could increase the proportion of severe COVID cases in an area)	High malnutrition	IPC AMN Phase classification Projection (May-August 2020)	Acute malnutrition reduces immunity	1	IPC AMN P2	IPC South Sudan Jan 2020
				2	IPC AMN P3	
				4	IPC AMN P4	
	WASH	% of population travelling 30 minutes or less to a water source AND have access to soap for handwashing	Access to clean water and soap are requisite for hand-washing practices, which is an essential preventive behavior to fight COVID-19.	0	>20%	FNSMS Round 25 data
				2	<=20%	
	Healthcare access	% of population walking more than ½ day to a functional health facility	Individuals may be asked to stay at home with suspected symptoms of COVID-19, but if case is critical, access to functional facility will impact mortality rate and containment.	0	<=10%	FNSMS Round 25 data ⁵
				1	>10% and <=30%	
				2	>30%	
	Infectious Disease (Non-COVID)	Presence of malaria 'epidemic', malaria 'alert' or other confirmed disease outbreak	<p>The dual burden of malaria or other infectious diseases and COVID-19 will likely increase morbidity and mortality as other illnesses become more difficult to treat due to competing health system resources. COVID will also reduce the health systems ability to deal with Areas with high burdens of disease prior to COVID may be among the heaviest hit. Especially some concerns of co-morbidity of malaria and COVID-19. Malaria is treated here is a proxy for infectious diseases.</p> <p>Epidemic levels of malaria: # malaria cases in the given epidemiological week > long term mean + 2 SD from the same epidemiological week in previous years</p> <p>Alert levels of malaria: # malaria cases in the given epidemiological week > the third quartile of cases compared to the same time in previous years.</p> <p>OR confirmed disease outbreak</p>	0	No disease outbreak	IDSR/EWARS
				1	'Alert' level of total morbidities or malaria specific	
			2	'Epidemic' levels of total morbidities or malaria specific OR confirmed disease outbreak		
Chronic Disease	% of HHs self-reporting a household member has a chronic illness in the last 3 months	General, self-reported question for populations that may have people with chronic health issues, however some chronic health issues may not necessarily link to immune suppression or increased risk of severe/critical COVID-19 cases.	1	> 10% HH report family members with chronic illness in last month	FNSMS Round 25	

Vulnerability Analysis Framework: Key Assumptions and Rationales

- **Population movement from COVID affected areas** will increase the risk for entry, but any movement from neighbouring countries also increases the risk due to the lack of testing capacity in East Africa, and asymptomatic spread of COVID-19.
- **Population density** is related both to risk of entry and intersectoral vulnerability because it is highly correlated with the spread of COVID, and greatly increases the chances that vulnerable populations in that area will be reached by COVID.
- Areas with **high infectious disease morbidity** may be at higher intersectoral vulnerability due to competing health resources, weakened immune responses, and the risk of complications.
- **Acute food insecurity and acute malnutrition** are related to reduced immune response and may lead to more severe COVID cases.
- **Health access is not as important a factor for intersectoral vulnerability**, given that most people are advised to stay home if they get COVID.
- **Lack of access to key preventative measures** may increase the severity of an outbreak (e.g handwashing)

Vulnerability Analysis Framework: Limitations

Data Source	Limitations
Food Security and Nutrition Monitoring System (FSNMS)	Representative of rural areas only, data collection does not include large urban centers or displacement sites (camps or camp-like settings). Not frequently updated.
Population Density Data (COD-PS)	Aggregated at county level, so large unpopulated areas are included in population density results.
Flow Monitoring Data	Not exhaustive of all informal cross-border movement points Flow monitoring activities are limited in Southeast Upper Nile (Ulang, Nasir, Maiwut) Representative of flows in March 2020 only Flow data based on counties of departure/arrival, not crossing points
Integrated Disease Surveillance and Response (IDSR)	Currently only using malaria or confirmed disease outbreaks as a proxy for morbidity. Not capturing acute respiratory infections or diarrheal diseases in analysis. Only data up to through EpiWeek 9 (end of February) in analysis right now. Completeness for IDSR/EWARS reporting may vary from county to county: limited completeness/timeliness of reporting in parts of Upper Nile (Panyikang, Baliet, Malakal, Southern Upper Nile), Kapoeta North, Kapoeta East, and parts of Central Equatoria (including Morobo, Lainya and Magwi).
CCCM Cluster – Camp-like settings in SSD; UNHCR	May not be representative of new camp-like settings established in 2020, or informal or unofficial camps
UNICEF COVID Case data	Reported cases in March 2020 only. Limited by administrative level of reporting (some countries reporting at different administrative levels)
European Commission Global Human Settlement Data	Based on satellite data from 2015 – does not account for most recent flows of displacement from 2015-2020.

Items to consider for future iterations...

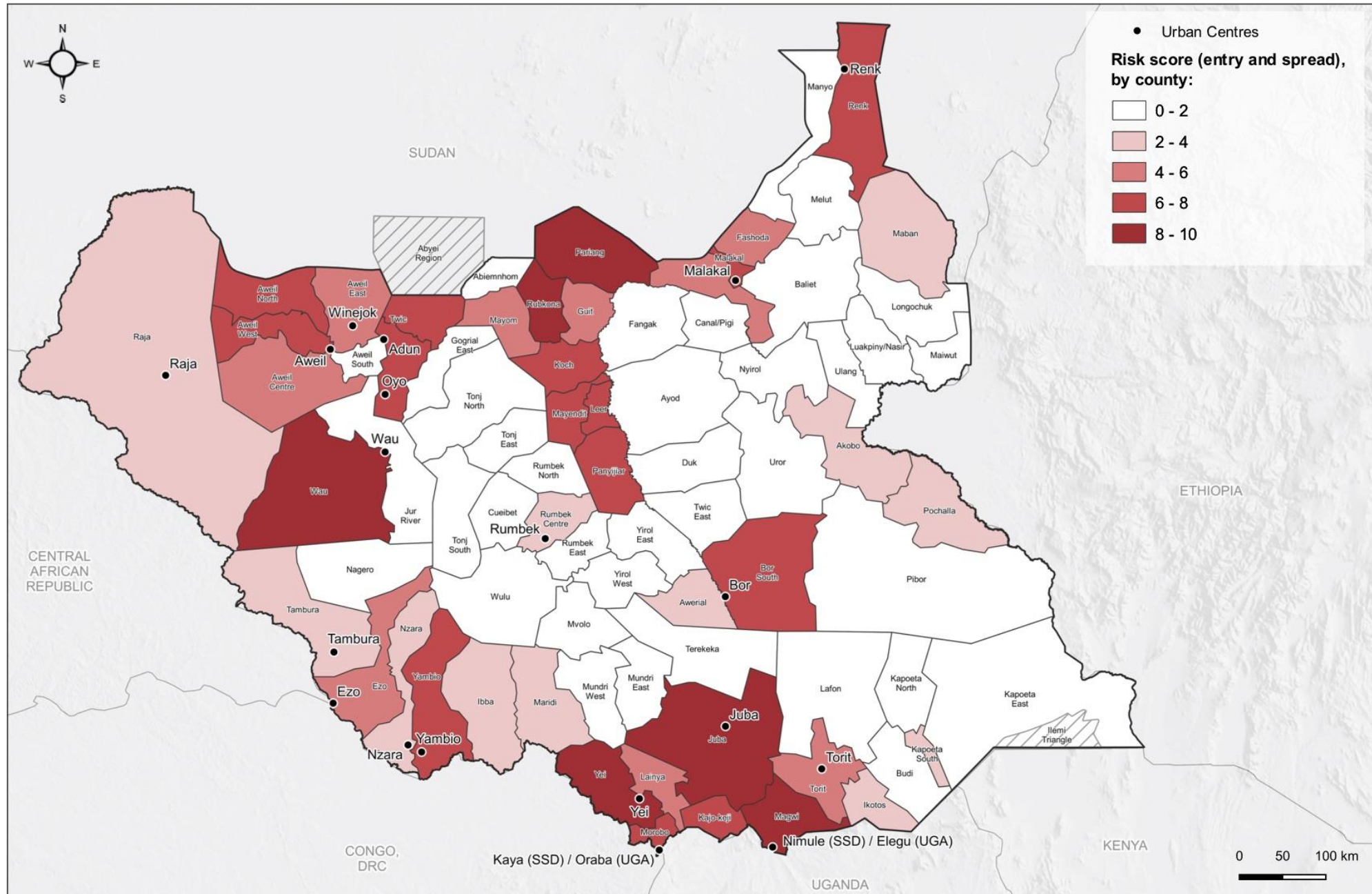
Gaps in framework:

- *Internal population movement;*
- *Reliance on humanitarian aid;*
- *Movements through key points of entry*
- *Size of caseloads in South Sudan & affected-area in neighbouring countries*
- *Conflict*

How can we adjust the framework in the future to account for major shocks?

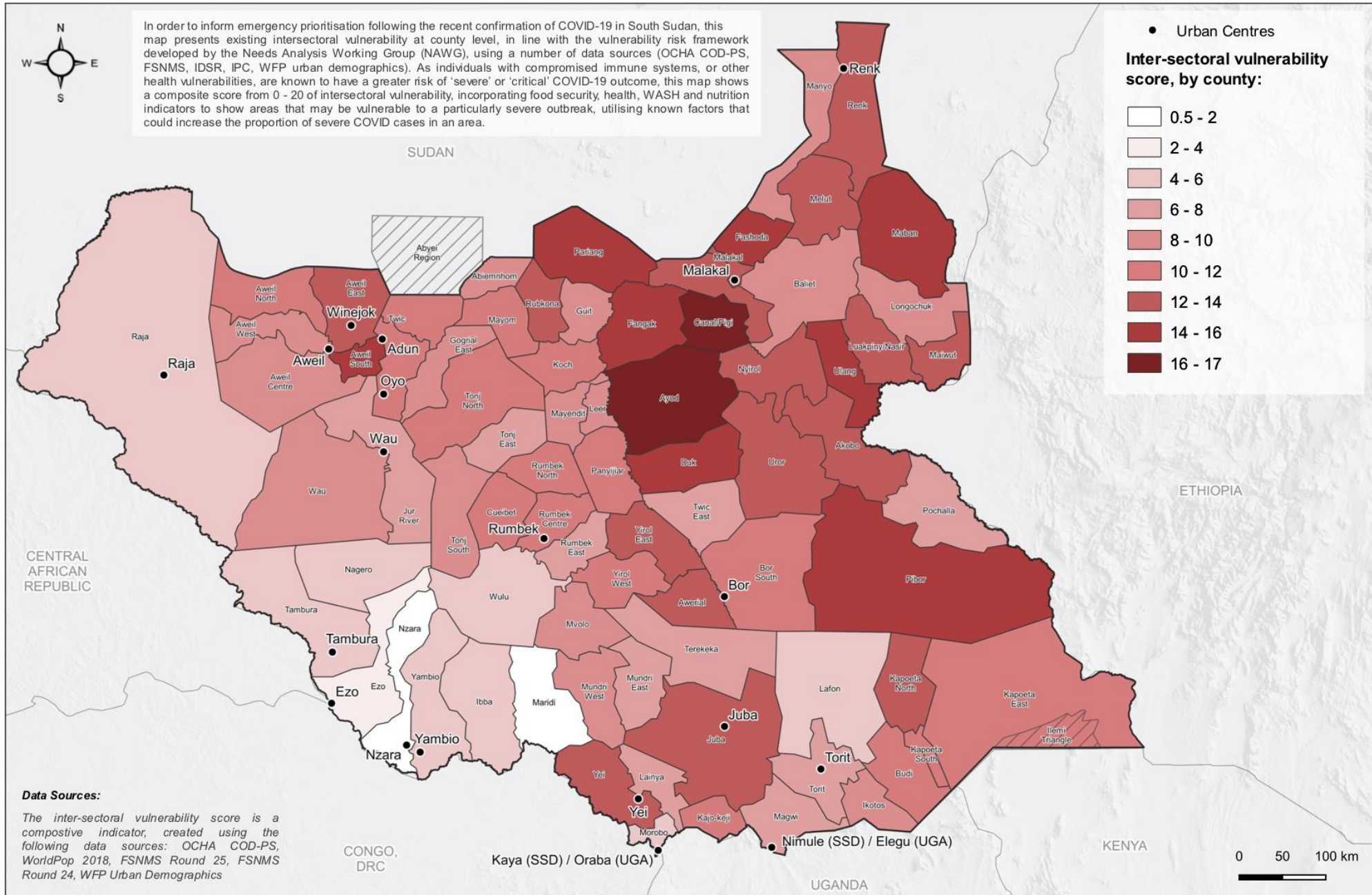
SOUTH SUDAN - Risk of Entry and Spread of COVID-19, by County

For Humanitarian Purposes Only
Production date: 20/04/2020



SOUTH SUDAN - Risk of Severe Outbreak (Inter-Sectoral Vulnerability), by County

For Humanitarian Purposes Only
Production date: 20/04/2020



Vulnerability Analysis Scores: Top 15 Counties for Risk of Entry/Spread and Intersectoral Risk

Top 15 Counties for Risk of Entry/Spread

County Name	Risk Score (Entry and Spread) (0-12)	Intersectoral Vulnerability (0-25)
yei	10	13
rubkona	10	13
juba	9.75	12.75
pariang	8.5	14.5
wau	8.5	9.5
magwi	8.5	7.5
malakal	8	12.5
aweil west	7.5	9.5
koch	7.25	11.25
leer	7	9
morobo	6.75	5.75
renk	6.5	14
kajo-keji	6.5	12
panyijiar	6.5	11.5
mayendit	6.5	8.5

Top 15 Counties for Intersectoral Risk

County Name	Risk Score (Entry and Spread) (0-12)	Intersectoral Vulnerability (0-25)
ayod	2	17
canal	0.5	16.5
pibor	1	16
maban	2.5	15.5
fangak	1.25	15.25
ulang	1.25	15.25
fashoda	5.5	15
pariang	8.5	14.5
duk	1.25	14.25
aweil south	1.25	14.25
renk	6.5	14
nyiról	1	14
luakpiny/nasir	1.5	13.5
uror	0.5	13.5
yirol east	1.25	13.25

High Risk counties in common: Pariang, Renk

Potential High Risk Counties for Entry, Spread, and Intersectoral Vulnerability:

Risk of Entry ≥ 6 ; Intersectoral Vulnerability ≥ 10

County Name	Risk Score (Entry and Spread) (0-12)	Intersectoral Vulnerability (0-25)
rubkona	10	13
yei	10	13
juba	9.75	12.75
pariang	8.5	14.5
malakal	8	12.5
koch	7.25	11.25
renk	6.5	14
kajo-keji	6.5	12
panyijiar	6.5	11.5
bor south	6.25	11.75
gogrial west	6.25	11.75
twic	6.25	11.75
aweil north	6.25	11.25
aweil east	6	12.5
mayom	6	11.5

- These counties are being flagged to be recommended as prioritized due to both high intersectoral vulnerabilities combined with a high risk of entry and spread of COVID-19.

- Based on contextual knowledge, which counties appear overrepresented? Underrepresented?

County/regional gaps?

- Southeastern Upper Nile

Things to note:

- The movement and COVID-19 caseload data is from March
- Intersectoral vulnerability is less likely to change dramatically each month and data sources sources are also more static

High Risk Counties for Entry, Spread, and Intersectoral Vulnerability:

Highest indicators for high risk counties

Rubkona	Migration from COVID affected areas in neighbouring countries
Entry/spread 10	# of IDPs/refugees in camp-like settings High acute malnutrition
Intersectoral 13	Low access to soap and water Low access to health facilities Presence of infectious diseases

Yei	Migration from COVID affected areas in neighbouring countries
Entry/spread 10	Presence of urban centre(s) High food insecurity High market dependence
Intersectoral 13	Low access to soap and water

Juba	Migration from COVID affected areas in neighbouring countries
Entry/spread 9.75	Presence of urban centre(s) High acute malnutrition High market dependence
Intersectoral 12.75	Low access to soap and water

Pariang	Migration from COVID affected areas in neighbouring countries
Entry/spread 8.5	High acute malnutrition # of IDPs/refugees in camp-like settings High market dependence
Intersectoral 14.5	Low access to soap and water

Malakal	Migration from COVID affected areas in neighbouring countries
Entry/spread 8	High acute malnutrition High food insecurity High market dependence
Intersectoral 12.5	

Koch	Migration from COVID affected areas in neighbouring countries
Entry/spread 7.25	# of elderly persons per household High food insecurity High acute malnutrition
Intersectoral 11.25	Low access to soap and water Presence of infectious diseases

Renk	Migration from COVID affected areas in neighbouring countries
Entry/spread 6.5	High acute malnutrition High market dependence Low access to soap and water
Intersectoral 14	Presence of infectious diseases

Kajo-Keji	Migration from COVID affected areas in neighbouring countries
Entry/spread 6.5	High food insecurity High market dependence Low access to soap and water
Intersectoral 12	

High Risk Counties for Entry, Spread, and Intersectoral Vulnerability:

Highest indicators for high risk counties

Panyijiar	Migration from COVID affected areas in neighbouring countries
Entry/spread 6.5	High acute malnutrition
Intersectoral 11.5	High food insecurity High market dependence Low access to soap and water

Bor South	Migration from COVID affected areas in neighbouring countries
Entry/spread 6.25	High acute malnutrition
Intersectoral 11.75	High food insecurity High market dependence Presence of infectious diseases

Gogrial West	Migration from COVID affected areas in neighbouring countries
Entry/spread 6.25	High acute malnutrition
Intersectoral 11.75	High market dependence Low access to soap and water

Twic	Migration from COVID affected areas in neighbouring countries
Entry/spread 6.25	High acute malnutrition
Intersectoral 11.75	High market dependence Low access to soap and water

Aweil North	Migration from COVID affected areas in neighbouring countries
Entry/spread 6.25	High food insecurity
Intersectoral 11.25	High acute malnutrition High market dependence Low access to soap and water

Aweil East	Migration from COVID affected areas in neighbouring countries
Entry/spread 6	High food insecurity
Intersectoral 12.5	High acute malnutrition High market dependence Low access to soap and water Presence of infectious diseases

Mayom	Migration from COVID affected areas in neighbouring countries
Entry/spread 6	# of elderly persons per household
Intersectoral 11.5	High food insecurity High acute malnutrition Low access to soap and water

Counties with High Risk of Entry, Low Intersectoral Vulnerability:

Counties with Risk of Entry ≥ 6 
and Inter-sectoral Risk ≤ 10 

County Name	Risk Score (Entry and Spread) (0-12)	Intersectoral Vulnerability (0-25)
Wau	8.5	9.5
Magwi	8.5	7.5
Aweil West	7.5	9.5
Leer	7	9
Morobo	6.75	5.75
Mayendit	6.5	8.5
Yambio	6.5	6

These counties score high for risk of entry, but relatively low for inter-sectoral vulnerability, and thus are not currently accounted for in the highest-risk counties list.

Question to consider:

- Are any of these counties appropriate to prioritise due to their risk of entry, despite lower vulnerability levels?**

Counties with High Risk of Entry, Low Intersectoral Vulnerability:

Highest scoring indicators

Wau	Migration from COVID affected areas in neighbouring countries
Entry/spread 8.5	High food insecurity Low access to soap and water Presence of infectious diseases
Intersectoral 9.5	

Morobo	Migration from COVID affected areas in neighbouring countries
Entry/spread 6.75	Low access to soap and water
Intersectoral 5.75	

Magwi	Migration from COVID affected areas in neighbouring countries
Entry/spread 8.5	Presence of urban centre(s) High acute malnutrition High market dependence
Intersectoral 7.5	

Mayendit	Migration from COVID affected areas in neighbouring countries
Entry/spread 6.5	High acute malnutrition High food insecurity Low access to soap and water
Intersectoral 8.5	

Aweil West	Migration from COVID affected areas in neighbouring countries
Entry/spread 7.5	High food insecurity High acute malnutrition High market dependence Low access to soap and water
Intersectoral 9.5	

Yambio	Migration from COVID affected areas in neighbouring countries
Entry/spread 6.5	Low access to soap and water
Intersectoral 6	

Leer	Migration from COVID affected areas in neighbouring countries
Entry/spread 7	High acute malnutrition High food insecurity Presence of infectious diseases
Intersectoral 9	

Counties with High Intersectoral Vulnerability, Low Risk of Entry:

Counties with Risk of Entry < 6 
and Inter-sectoral Risk >= 15 

County Name	Risk Score (Entry and Spread) (0-12)	Intersectoral Vulnerability (0-25)
Ayod	2	17
Canal	0.5	16.5
Pibor	1	16
Maban	2.5	15.5
Fangak	1.25	15.25
Ulang	1.25	15.25
Fashoda	5.5	15

These counties score lower for risk of entry, but relatively high for inter-sectoral vulnerability, and thus are not currently accounted for in the highest-risk counties list.

Question to consider:

- Are any of these counties appropriate to prioritise due to inter-sectoral vulnerability, despite having lower risk of entry?**

Counties with High Intersectoral Vulnerability, Low Risk of Entry:

Highest scoring indicators

Ayod	High food insecurity
Entry/spread 2	High acute malnutrition
	Low access to soap and water
	Presence of infectious diseases
Intersectoral 17	

Fangak	High acute malnutrition
Entry/spread 1.25	High food insecurity
	# of elderly persons per household
	Low access to soap and water
Intersectoral 15.25	Presence of infectious diseases

Canal	High acute malnutrition
Entry/spread 0.5	High food insecurity
	# of elderly persons per household
	High market dependence
Intersectoral 16.5	Low access to soap and water
	Presence of infectious diseases

Ulang	High acute malnutrition
Entry/spread 1.25	High food insecurity
	High market dependence
	Low access to soap and water
Intersectoral 15.25	

Pibor	High acute malnutrition
Entry/spread 1	High food insecurity
	High market dependence
	Low access to soap and water
Intersectoral 16	Presence of infectious diseases

Fashoda	Migration from COVID affected areas in neighbouring countries
Entry/spread 5.5	High acute malnutrition
	High food insecurity
	High market dependence
Intersectoral 15	Low access to soap and water

Maban	# of IDPs/refugees in camp-like
Entry/spread 2.5	# of elderly persons per household
	High food insecurity
	High acute malnutrition
Intersectoral 15.5	High market dependence
	Low access to soap and water

Possible areas of concern not reflect in either category?

- Maiwut and/or other areas of SE UNS (due to existing gaps in data)
- Others...?

NTF COVID-19 HOTSPOTS *(for reference)*

1. Juba
2. Wau
3. Yambio
4. Nimule
5. Palouch
6. Renk
7. Refugee and IDP population in priority areas