

Can open South Sudan Health facility location data help inform covid vaccine distribution ?

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DRAFT [Code for this document](#)

Summary

This draft report is part of a [pilot project run by MapAction](#) funded through a private donor.

The purposes of the pilot project are:

- an immediately useful country data readiness package, documented and publicly available;
- to be in a better position to respond extremely quickly to COVAX's needs;
- and to build learning and community practice around the process to inform future work.

This report focuses on the availability of health facility data to inform covid vaccine distribution. It aims to inform the choice of data to include in the data package created by the pilot project.

The initial (draft) conclusion is that the data downloadable from the Ministry of Health website at <https://www.southsudanhealth.info/> (**2889** recorded facilities) would be the most appropriate to include in the pilot data package. This is despite those data being dated and superceded locally by a cleaner dataset visible in the [South Sudan Health Service Functionality \(HSF\) Dashboard](#). The HSF data has fewer facilities (**1890**) with many more attributes, processed in collaboration between WHO and the Ministry of Health. Unfortunately, we do not have permission to use and/or redistribute these latter data, despite reaching out.

The data stored in OpenStreetMap/healthsites.io are much sparser (**156**). We recommend improving the data in OpenStreetMap/healthsites.io as a longer term solution. For this project it is unlikely to be useful to combine the two datasets, partly because of technical difficulties in doing so, and partly because, when there are disagreements, there is no clear rationale for establishing which source is likely to be the more correct.

If we were able to gain permission to access and use the data displayed in the [South Sudan Health Service Functionality Dashboard](#) (and summarised below) using them would be much better.

Exploring available Health facility data

The following sources of health facility locations for South Sudan are available.

1. MoH : downloaded from Ministry of Health website <https://www.southsudanhealth.info/>
2. HSF : [South Sudan Health Service Functionality Dashboard](#) (locations not downloadable, licensing uncertain). A collaboration between MoH & WHO.
3. OSM : healthsites.io in OpenStreetMap
4. Kemri : collated data from published paper Maina(2019) Kemri, hosted by WHO GMP
5. HDX : latest version on Humanitarian Data eXchange, labelled MoH 2016

For now I will focus mostly on the top three, because the latter two are older.

Table 1. Numbers of facility locations per source.

source	num facilities	num hospitals	coords?	useful attributes
1. MoH	2889	130	coords (2553 with, 336 without)	only Facility codes e.g. FC05040202
3. HSF	1890	82	not downloadable, (1671 with coords, 219 without)	lots e.g. functionality, staff & bed numbers (few complete)
2. OSM	432	72	coords	beds,staff_doctors,staff nurses
4. Kemri	1734	40	coords	no attributes
5. HDX	1464	53	coords	codes & functional status

The downloadable MoH data do not seem to have changed in the last year.

Both the MoH and HSF websites have contact emails indicating that they will answer queries. We reached out to both twice in April May 2021 and received no reply. We also emailed senior members of the WHO GIS team and received no reply.

The Functionality Dashboard says this about the data displayed there : “Facility data for this bulletin was kindly contributed by the Health Cluster partners, Health Pooled Fund (HPF), the International Committee of the Red Cross (ICRC), Management Sciences International (MSI), UNICEF, and UNHCR. Additional service availability data was extracted from the Ministry of Health DHIS2 platform for facilities without an implementing partner report. Most data was reported as of 31 March 2020, but the report date for each facility is indicated by hovering over a facility marker on the map. Implementing partners self-report on a quarterly basis service availability based predefined, standardized service availability data points and definitions. WHO merges the respective data sets and assigns a functionality level to each facility based on the criteria below.”

Thus the HSF data seem to be the most comprehensive and up-to-date, but are not easily downloadable, do not have coordinates and do not have licencing information.

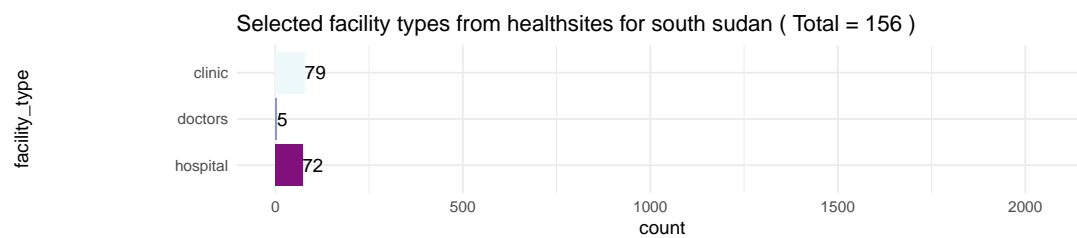
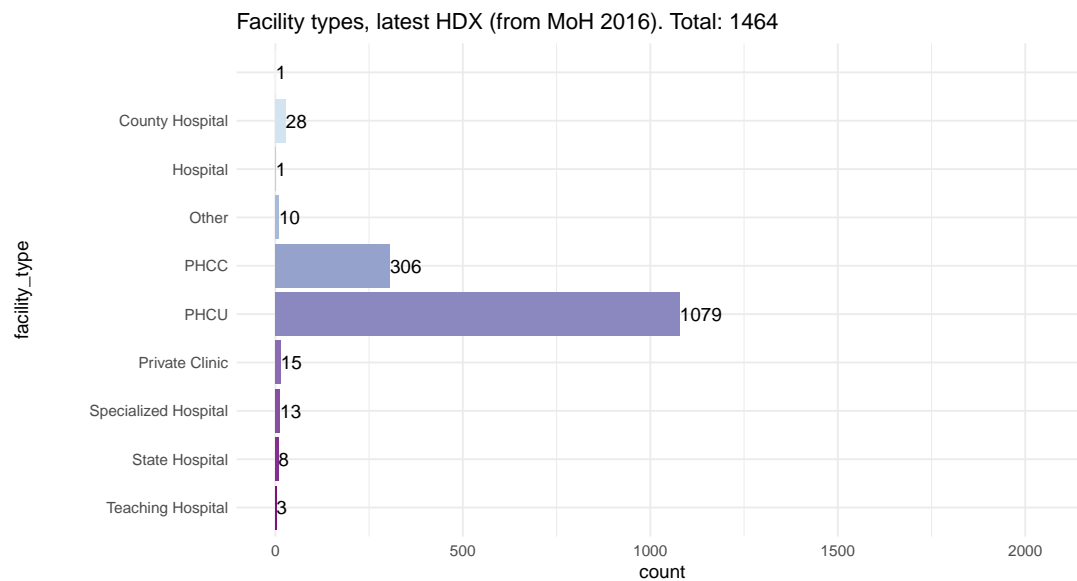
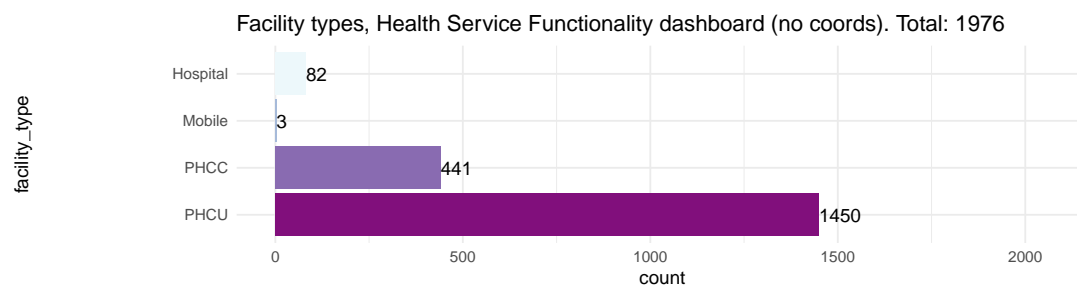
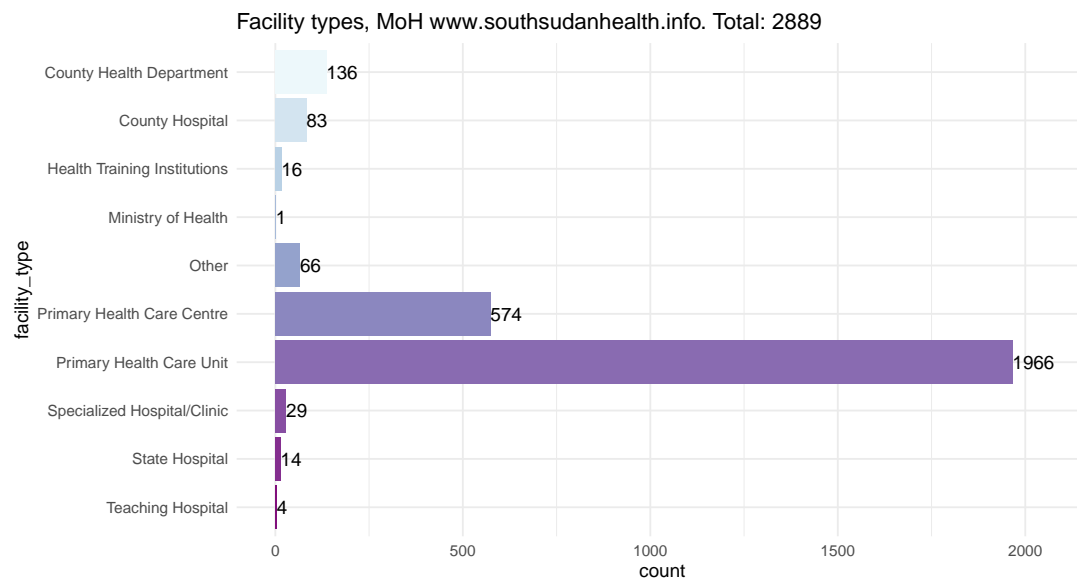
I did copy & paste the HSF data from the 19 separate pages so that I can summarise it in the figures below. I am not sure whether we are in a position to share these further without any permission from WHO or MoH.

I could try to join the data from HSF with that from the MoH website to add coordinates to the functionality data (and conversely to add attributes to the MoH data), but I’m not sure of the value of this given that it is re-doing something that someone in WHO/MoH has done already.

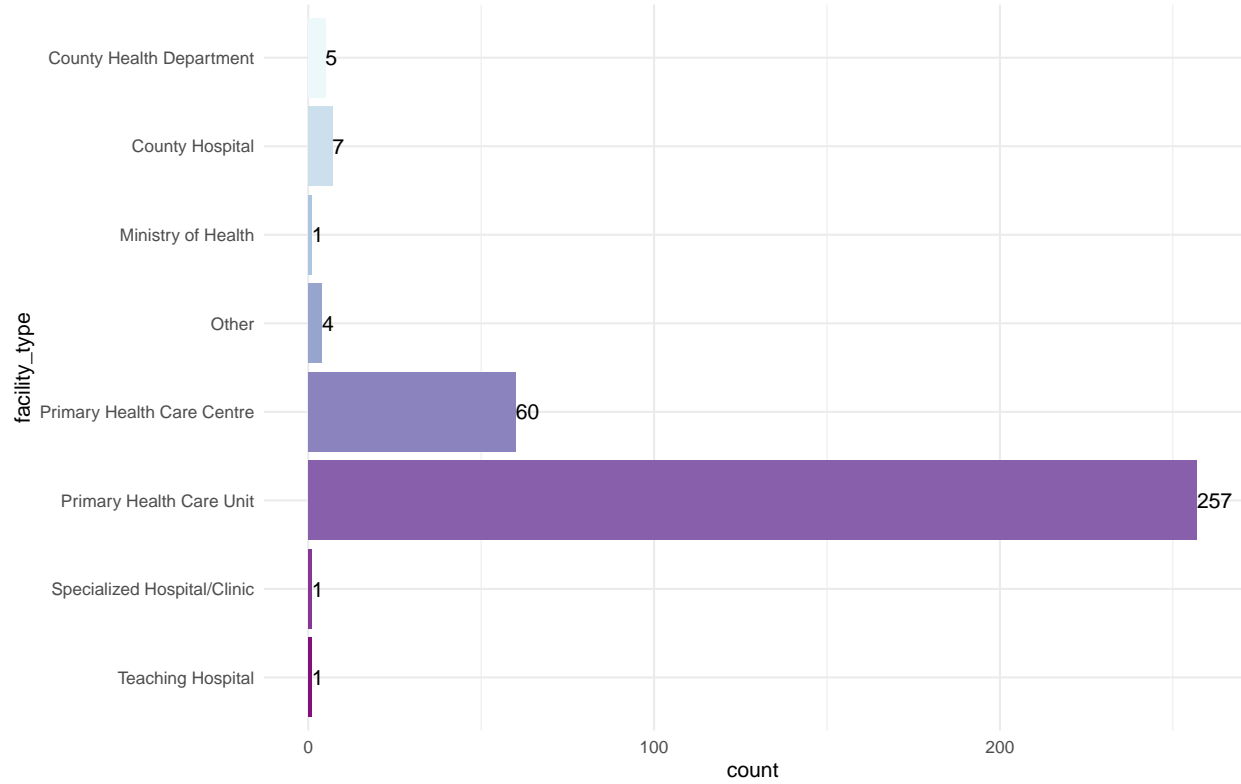
The MoH website also has associated attribute data (e.g. staff numbers), that can be accessed by clicking on a facility entry, but these data do not appear in the download, so this is not a feasible method for obtaining attributes for large numbers of facilities. In addition the licensing for these data is not stated.

The HSF data has the richest attributes with these column names :

[1] "ID"	"Report date"
[3] "State"	"County"
[5] "Facility"	"Facility type"
[7] "Functionality"	"OPD"
[9] "EPI"	"ANC"
[11] "PNC"	"SBA"
[13] "BEmONC"	"CEmONC"
[15] "FP"	"PMTCT"
[17] "ART"	"TB"
[19] "BHI"	"Inpatient - Paeds"
[21] "Inpatient - Adult"	"Basic surgery"
[23] "MHPSS"	"SGBV"
[25] "NCD"	"Nut. OTP"
[27] "Nut. TSFP"	"Nut. SC"
[29] "Laboratory"	"Disability"
[31] "# Clinical staff"	"Essential meds stockout"
[33] "FP stockout"	"Vaccine stockout"
[35] "Ambulance access"	"# Inpatient beds - adult"
[37] "# Inpatient beds - paeds"	"Electricity"
[39] "Latrine"	"Dedicated mobile phone"
[41] "EPI refrigerator"	"Protected water source"



336 Facilities in the MoH data with no coordinates



Subsetting Hospitals in Juba county for initial detailed comparison

This shows that, although some are shared, hospital names differ between the 3 sources.

It gives an idea of the magnitude of the problem of trying to combine data sources, and points to the potential folly of trying to repeat data cleaning that has already been done to arrive at the Health Service Functionality (hsf) dataset.

Even when names are shared between data sources they may differ slightly e.g.

moh : El Sabbah Children Hosp

hsf : El-Sabah Children Hospital

The OpenStreetMap data show examples of :

1. un-named facilities (row1)
2. facilities that appear not to be hospitals (e.g. row7 primary health care unit, row8 high court & row14 small clinic)
3. facilities now closed (row18)

Table 2: Juba county hospitals from different data sources

row	moh	hsf	osm
1	Alsabah Children Hospital	Al Amin Hospital	
2	Buluk Eye Clinic	Aspen Medical International Hospital	Aspen Clinic
3	Bungu General	Chinafriendship Hospital	Care Plus clinic
4	El Sabbah Children Hosp	El-Sabah Children Hospital	Chiness Hospital
5	Juba Military Hospital	Gudele Surgical Home Private Hospital	DMI Nursery
6	Juba Police Hospital	International Hospital	GUDELE SURGICAL CLINIC
7	Juba Teaching Hosp	Juba Medical Complex Hospital	Hai jebel primary health care unit
8		Juba Military Hospital	High Court & Judiciary
9		Juba Police Hospital	Juba Civil Hospital
10		Juba Teaching Hospital	Kampala International clinic
11		Mawuna Hospital	Military Hospital
12		Medicare Hospital	Nyakuron Health Center
13		Victoria Medical Hospital	Police Hospital
14			Small Clinic
15			Teaching Hospital
16			UNMISS Level 1 Hospital
17			UNMISS Level 2 Hospital
18			Used to be URG clinic, closed since Dec 2013
19			Usratuna PHCC

Exploring potentially useful attributes from Health Service Functionality data

(Note, it is not clear whether we have permission to use these data in this way).

