

Comparing health facility location data available for Saint Louis, Senegal

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This is a data-driven document [open-source code here](#)

Funded by COVIDaction Vaccine Data Co-Lab - [Healthsites.io](#) Emergency health data validation.

Initial comparison of data provided by COUS [Centre des Opérations d'Urgence Sanitaire](#) & DPRS [Direction de la Planification, de la Recherche et des Statistiques](#) for Saint Louis with OSM Senegal survey conducted in February 2022.

Summary The aim is to see if we can develop re-useable code to help with the process of improving health facility location data by comparing and combining data from different sources.

Prior to an in person workshop COUS and DPRS provided data.

COUS provided data for 9 facilities in Saint Louis in a table with **9 rows** and **130 columns** including coordinates and attributes such as the numbers of beds and staff.

DPRS provided the names of facilities and regions for Saint Louis in a file with **374 rows** and **1 column**. Due to the format of the data, it is not straightforward automatically to compare these with the COUS data.

OSM Senegal surveyed facilities in person in Saint Louis, providing a file with **394 rows** and recording attribute data in **289 columns**.

source	num facilities	columns of info	coords?
1. COUS	9	130	coords
3. DPRS	<374	1	no
2. OSM-Senegal survey	394	289	coords

Agreement on a strict naming convention for facilities would make it much easier to compare and combine these data.

COUS data

COUS provided an Excel file with two sheets.

COUS Sheet2 for Saint Louis has nine facilities **9 rows** and **130 columns** including coordinates and attributes such as the numbers of beds and staff.

Names of facilities.

cous_names
EPS1 de Richard Toll
Centre de Sante de Dagana
Centre de Sante de Saint Louis
Centre de Sante Amadou Malick Gaye
Centre de Sante de Pete
Centre de santé de Richard Toll
HOPITAL REGIONAL DE SAINT LOUIS
CHR NDioum
Centre de santé de Ross Bethio

DPRS data

DPRS provided the names of facilities and regions for the whole country in a file with **374 rows and 1 column**.

Looking at the first 9 rows of the DPRS data.

dprs_names
[-] RM Saint-Louis
[-] Dagana
CS Dagana
DPC de Dagana
PM MAC Dagana
PS 4e Et 5e Secteur
[-] PS Bokhol
Case de Geum Yalla
PS Bouteyni

We can see that sometimes rows indicate regions, e.g. [-] **RM Saint-Louis** and [-] **Dagana**. Also sometimes a row with a [-] indicates a facility that has control over others e.g. [-] **PS Bokhol**. Seems that if a row has a [-] and does not have PS, CS or Case then it is a region instead of a facility - this could be extracted automatically.

We can compare the COUS & DPRS tables above to check whether the facility names in the COUS data appear exactly the same as in the DPRS data. We would need to be able to write code to find matching names to be able to write a reproducible pipeline for comparing data.

An initial search by eye shows the mismatches between naming in the two datasets. There is at least one facility in the COUS data that seems not present in the DPRS list (Centre de Sante Amadou Malick Gaye).

See section below for Comparison of facility naming between DPRS and the new OSM-Senegal survey.

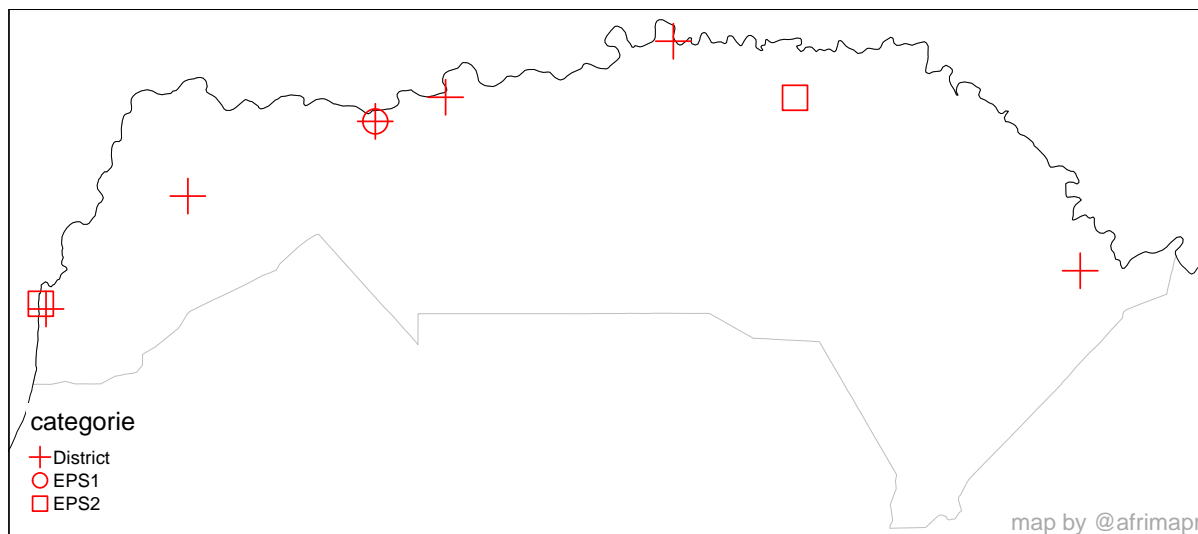
cous_names	dprs_names
EPS1 de Richard Toll	EPS 1 Richard Toll
Centre de Sante de Dagana	CS Dagana
Centre de Sante de Saint Louis	CS Saint - Louis
Centre de Sante Amadou Malick Gaye	?
Centre de Sante de Pete	[-] CS Pete
Centre de santé de Richard Toll	CS Richard Toll
HOPITAL REGIONAL DE SAINT LOUIS	EPS2 de Saint Louis
CHR NDioum	?Antenne de Ndioum

cous_names	dprs_names
Centre de santé de Ross Bethio	[-] CS Ross Bethio

Categories of COUS health facilities Saint Louis

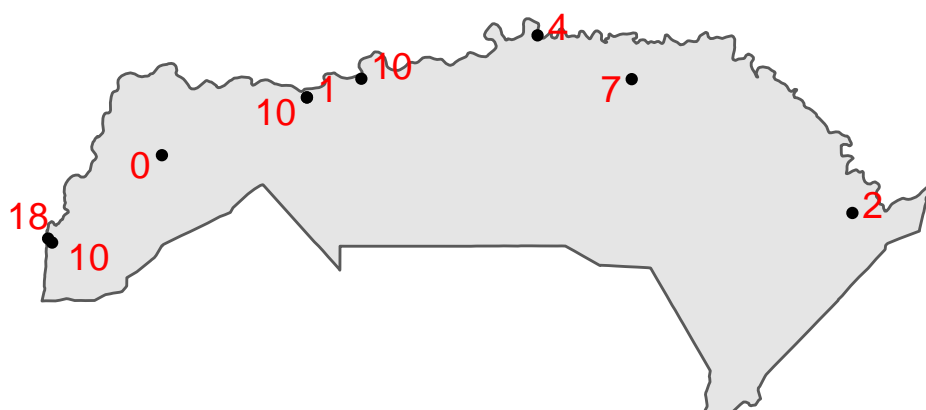
The coordinates provided in the COUS data allow these to be plotted on maps. (Note that one coordinate was missing a negative sign that incorrectly placed it in Chad, it was corrected for the maps here).

COUS health facilities Saint Louis 2022

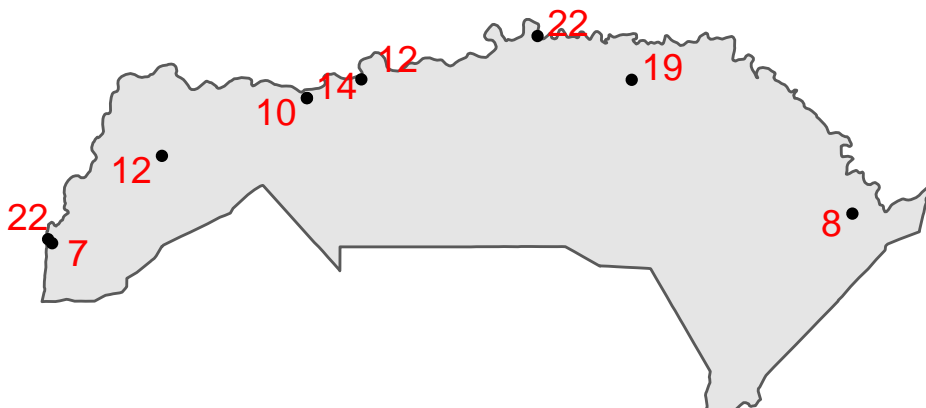


Numbers of beds (lits) in different wards from COUS data

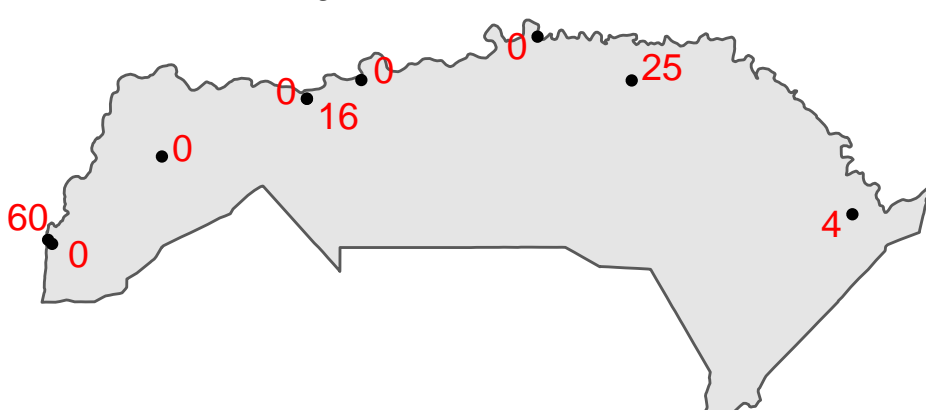
COUS lits_en_sau



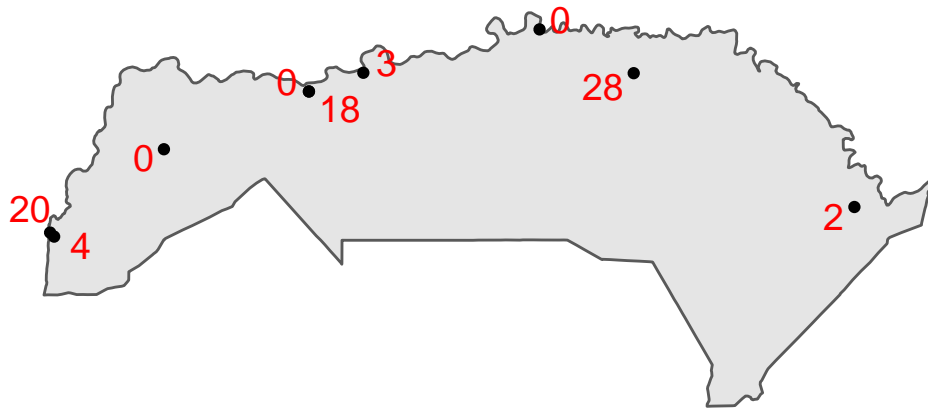
COUS lits_en_medecine



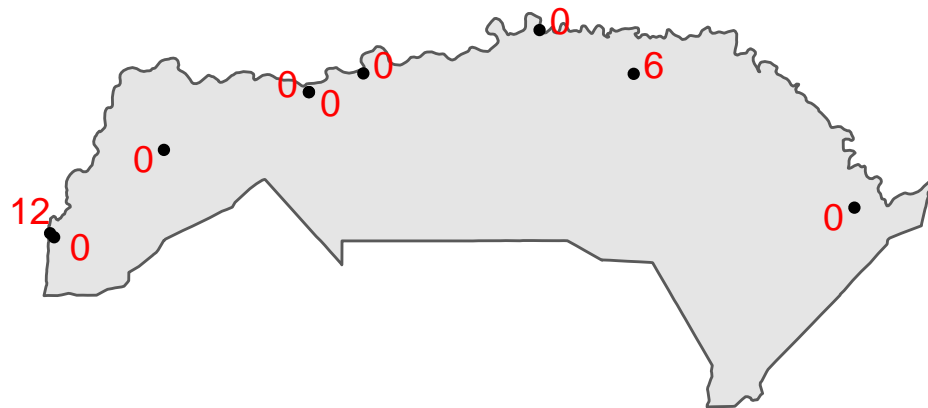
COUS lits_en_chirurgie



COUS lits_en_pediatrie



COUS lits_en_reanimation



OSM-Senegal survey

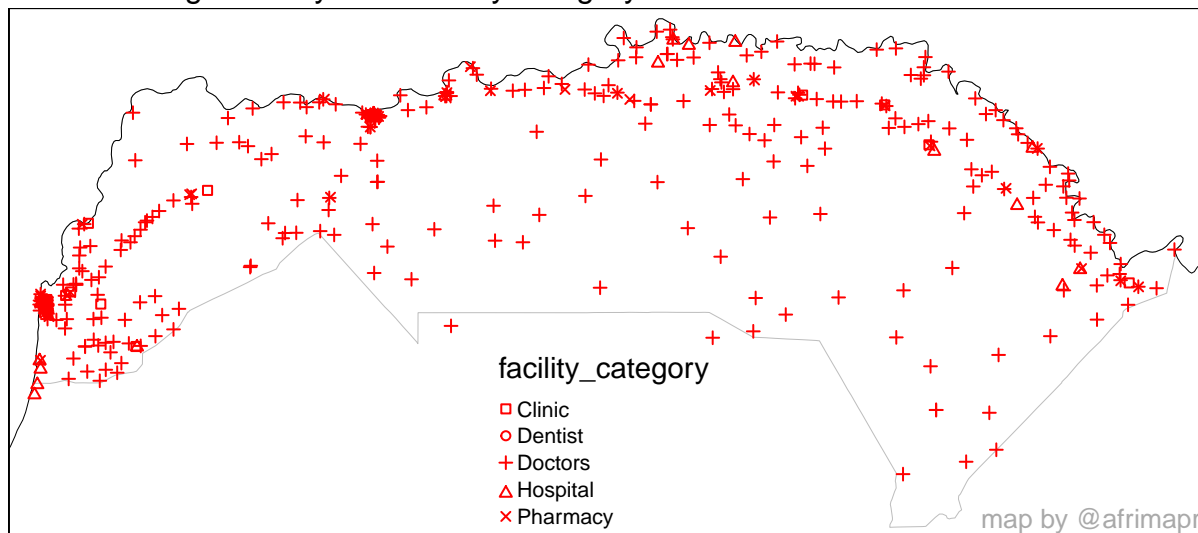
OSM-Senegal surveyed facilities in person in Saint Louis in February 2022, providing a file with 394 rows and recording attribute data in 289 columns. Here are some maps summarising the facilities surveyed.

Categories of facilities in OSM-Senegal survey

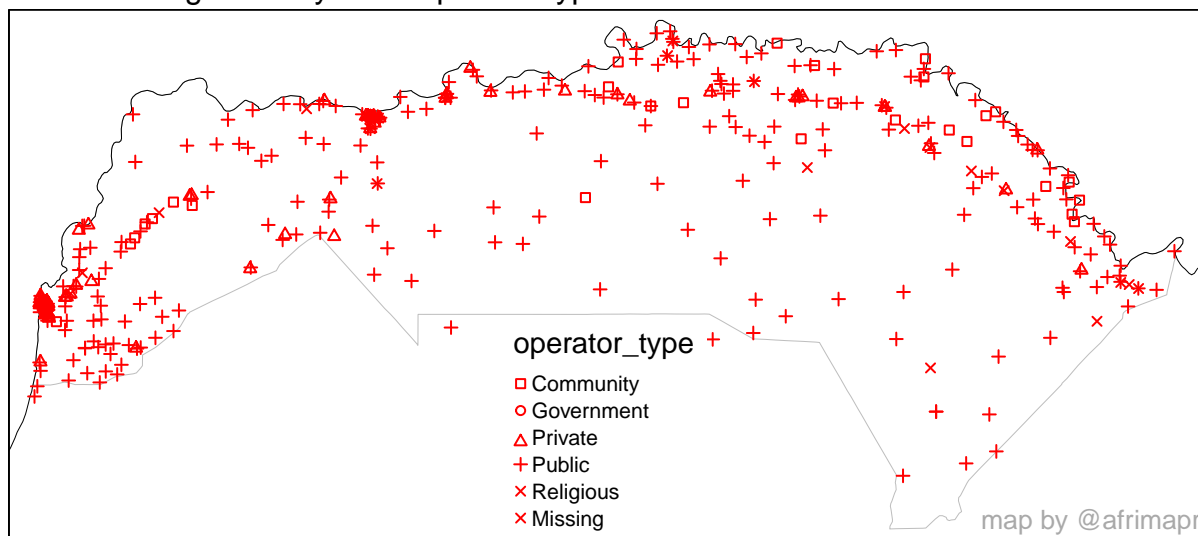
Senegal health facility levels are converted into OSM categories of Hospital, Clinic, Doctor as follows :

Senegal level	Senegal type	Senegal abbreviation	OSM category
1	Hopital	HP	Hospital
1	Etablissement public de Santé 1 (départementale)	EPS 1	Hospital
1	Etablissement public de Santé 2 (régionale)	EPS 2	Hospital
1	Etablissement public de Santé 3 (nationale)	EPS 3	Hospital
2	Centre de Santé	CS	Clinic
2	District de Sanitaire	DS	Clinic
3	Poste de Santé	PS	Doctors
3	Case de Santé	Case de	Doctors

OSM–Senegal survey 2022 facility category

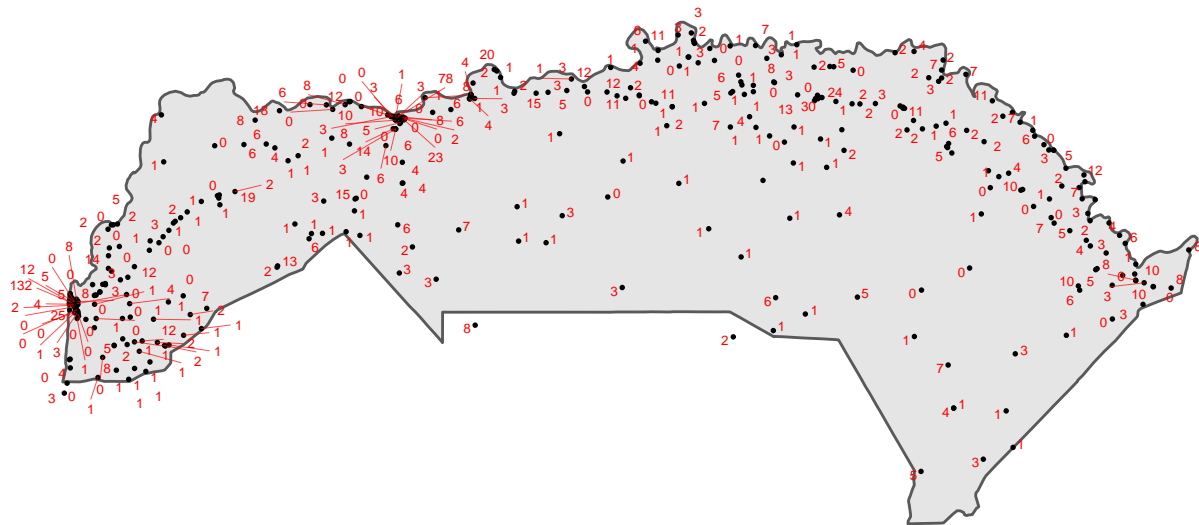


OSM–Senegal survey 2022 operator type

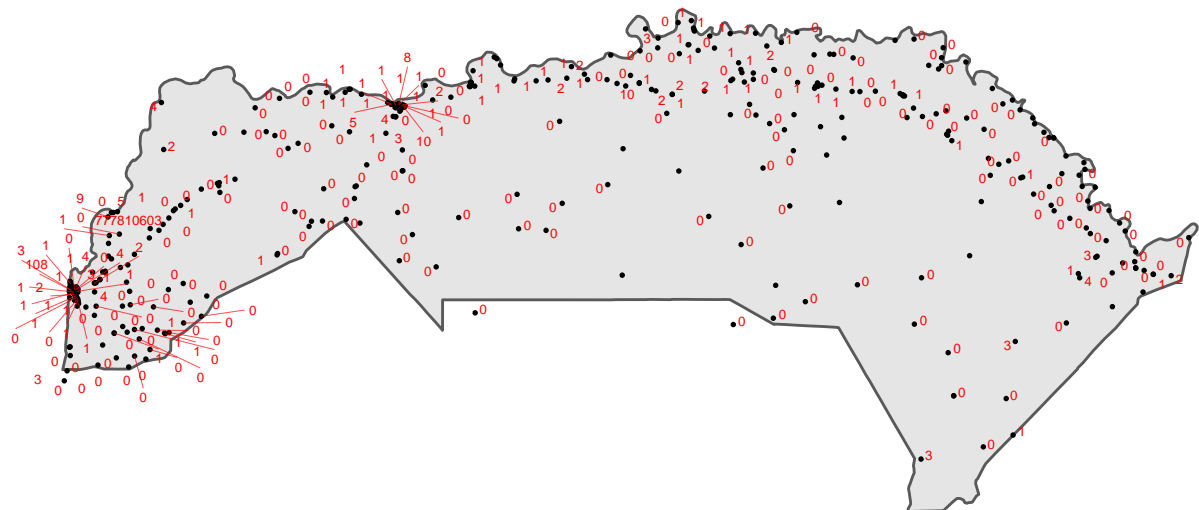


Numbers of beds, doctors and nurses from OSM-Senegal survey

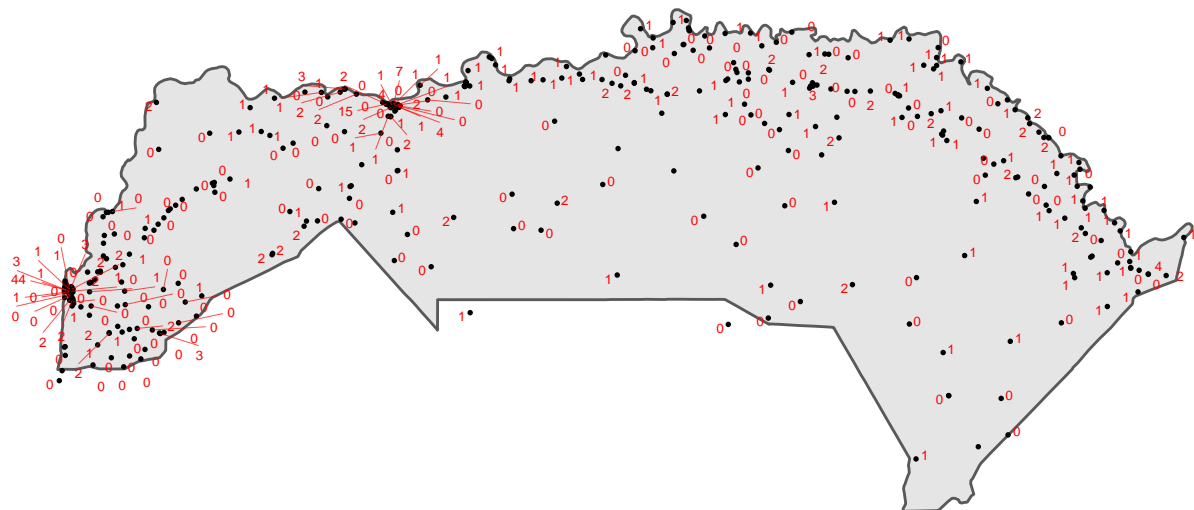
OSM number_of_beds



OSM number_of_doctors



OSM number_of_nurses



Comparison of facility naming between DPRS and the new OSM-Senegal survey

Can we automatically match facility names in the OSM-Senegal survey data with their equivalent names used by DPRS ?

In short, not with the raw data. Trying to match the exact names results in zero matches between DPRS & OSM. This can be addressed.

The DPRS data mostly uses abbreviations for facility categories.

Senegal level	OSM naming	DPRS abbreviation
1	Hopital	HP
1	Établissement public de santé	EPS
2	Centre de Santé	CS
2	District de Sanitaire	DS
3	Poste de Santé	PS
3	Case de Santé	Case de

Other DPRS abbreviations DPC (3), PM (9 of them).

There are also differences in upper/lower case, accents, use of 'de' & spaces.

We can try the following to match the names

1. expanding the abbreviations from DPRS
2. remove accents
3. convert to lower case
4. ensure just single spaces

5. remove 'de'
6. remove '[-]' which indicates hierarchy in DPRS

We can apply these approaches to both datasets, then we get simplified names. **137** of these simplified names from the OSM-survey data match with the DPRS list. Here are the first few as an example.

x
case sante grand mpal
case sante mbaye mbaye sarr
case sante khelcom diop
case sante merina sall
case sante ndialakhar peulh
case sante mbathiass
case sante semel
case sante touba guene
case sante gantour

This leaves **257** facilities in the OSM survey data that do not match names in the DPRS data. This can be because :

1. facility is not present in DPRS (note the survey included pharmacies not present in DPRS)
2. the simplified name still differs from how the same facility is named within the OSM data.

The 257 un-matched names are shown in the table below.

unmatched_osm_names	x2	x3
case sante chifatoul askham	pharmacie rokhaya gaye	croix rouge thiawle
boubacar medina baye		
case sante teud biti ndogal	gran pharmacie guet ndarienn	croix rouge woure dieri
centre sante mpal	poste sante hydrobase	infirmierie camp militaire
case sante takh mbeut	maternite poste sante guet	case korkadie
	ndar	
case sante maka toube	poste sante bango	poste sante mboyo
poste sante rao la maternite	direction la la mecine du	case sante
	travail	
case sante pelour	laress	poste sante diatar
case sante ngui nguelakh	cm crous	case sante fo ass
poste sante gandon	cerpad	poste sante doue
poste sante fass ngom	pharmacie darou salam	poste sante niandane
case sante tall bakhle	pharmacie amadou	case sante ouro madiw
case sante ndakhare	poste sante ngallele	poste sante diambo
clinique le sine	centre sanitaire secondaire	case sante feu moustapha ba
	richard toll	mbanetou
case sante bidiam	poste sante el hadji malick sy	poste sante
case sante ndioubé nane	poste sante richard toll escale	poste sante alwar
	croix rouge	
case sante gonio	poste sante ndiaw ndiangué	poste sante pathe galo
case sante ndiebene toube	poste sante thiabax	arifounda
poste sante rao	etablissement public sante	case sante ndormboss
	richard toll	
case sante ndiakhip	infirmierie seneindia	poste sante sinthiou dang

unmatched_osm_names	x2	x3
poste sante mbarigo	case sante belinamary	poste sante demette
poste sante_ pmi ngaye	case sante sante lamo	poste sante gamadji sare
case sante lampsar	poste sante diagle	poste sante ndioum
case sante ndiougou	cabinet ntaire dr ousmane loum	poste sante namarel
case sante	service medical css richard toll	case sante wourou maham
centre sante ross bethio	plateau medical seydina alioune	case mboubi ndiyam
pharmacie guy sedle	cabinet medical le walo	poste sante taredji
pharmacie alhamdoulilah	cabinet medical thierno souleymani baal	hiwirgo
pharmacie la pikinoise	cabinet paramedical sokhna mame diarra bousso	poste sante ndombo- alarba
pharmacie mame awa	pharmacie rosso	ipress podor
poste sante	poste sante rosso 1	case sante aba
pharmacie chateau d'eau	poste sante rosso 2	hopital regional saint-louis
pharmacie yaye diabou	service medical ipres	maison d'arret et correction
pharmacie regionale d'approvisionnement	poste sante ndiatene	poste sante toul galle
pharmacie du fleuve	poste sante ronkh	pharmacie el.h.omar foutiyou tall dol
centre medico-social la croix rouge	poste sante kassak sud	clinique dr sall
pharmacie ndiolofene	poste sante kassak nord	poste sante dol
pharmacie cheikh oumane mbacke	case sante ndiak fall	case sante gawdi goti
pharmacie malang lyss	poste sante diawar	poste sante bo lao
clinique medicale la corniche	case sante diadiam	case sante doubangue
pharmacie mbathio	infirmierie casl	pharmacie el hadj oumar de dol
clinique el hadji adama wa	case sante nadiel	pharmacie du lao
poste sante pmi sor	case sante guiladou	case sante doumga
pharmacie mame madia	poste sante guidakhar	poste sante madina diathmbe
pharmacie khadim rassoul	poste sante mbilor	poste diongui
poste sante tassinerie	poste sante deggu-niaye	centre sante pete
pharmacie gandiol	case sante gneling mbao	cabinet sante seydina mouhamed (psl) la vallee du fleuve
poste sante diama	infermerie mac	poste sante aere lao
pharmacie diama	poste sante secteurs lv-v	pharmacie thierno hamidou rabby
infirmierie cadre omvs	case sante darou salam	poste sante merry
case sante	dispensaire mission catholique dagana	boubba geriatrie ndioum
case sante taba hametou	pharmacie darou salam	case sante kadione 2
case sante mboumbene	cabinet ntaire	poste sante belel kele
infirmierie scl	pharmacie centrale djadime	case sante thiakli
case sante djiouthi	poste sante santhiaba	case boki ndoulo
etablissement public sante richard toll	poste sante gae	case sante kodielel
case sante saneinte	pharmacie amadou djiby sall gae	wendou diami
infirmierie gds	poste sante bokhol	poste sante base
case sante miguene boye	pharmacie bokhol	case sante seno bowol

unmatched_osm_names	x2	x3
case sante ndiol	poste sante tatqui	case sante mawdou thiaski
poste sante savoigne	pharmacie thille boubacar	pharmacie yiwele
case ndiougou mberesse	case sante bakaho	case sante banteu croisement
case sante ndiagabal	ndia	pharmacie yelitaare
pharmacie ross bethio	poste sante diagnoum	pharmacie almamy
pharmacie kantakare	case sante darou salam	ministere la sante
poste sante niassene	centre sante thiele boubacar	pharmacie hamidou rabi
case sante leybar boye	poste sante diamath	pharmacie ndiol fouta
poste sante ndombo	poste sante thiangaye	pharmacie papa latsouck faye
poste sante thiago	pharmacie nasrou lahi	centre sante saint _louis
case sante temey lewa	pharmacie khouma	pharmacie thierno amadou omar deme
pharmacie serigne babacar sy mbane	pharmacie richard toll	cabinet ntaire dr talab seck
poste sante mbane	pharmacie escale	suma urgences
case sante ndiokhor ile	pharmacie abdoul aziz sy	pharmacie mame yacine bop
infirmierie d'entreprise s	pharmacie abdoul aziz sy	case sante ngouy
poste sante gnith	pharmacie banl sall	poste sante yare lao
infirmierie d'entreprise west africa farms	pharmacie harouna	case maham
poste sante yam	clinique ntaire macha allah	case sante safalbe
case sante ndilim	pharmacie al almine ndombo sandjiry	poste sante guay kadar
pharmacie boulevard sud	poste sante sandjiry	poste sante yawal irlabe
pharmacie serigne abdou aziz sy	centre sante amadou malick guaye	poste sante bokke dialoube
pharmacie alsayegh	pharmacie	poste sante karawendou
centre medical garnison nord	case sante sal fanaye	case sante yawal
poste sante goxu mbaaj	case sante	poste sante poute
pharmacie bouchra	case belal bocar	case sante thiame thille
pharmacie khalifa ababacar sy	pharmacie ndiayene pendao	case sante guirwass
pharmacie binta diagne	poste sante et maternite ndiayene pendao	pharmacie pete
poste sante ndar toute	croix rouge thiafle	poste sante