

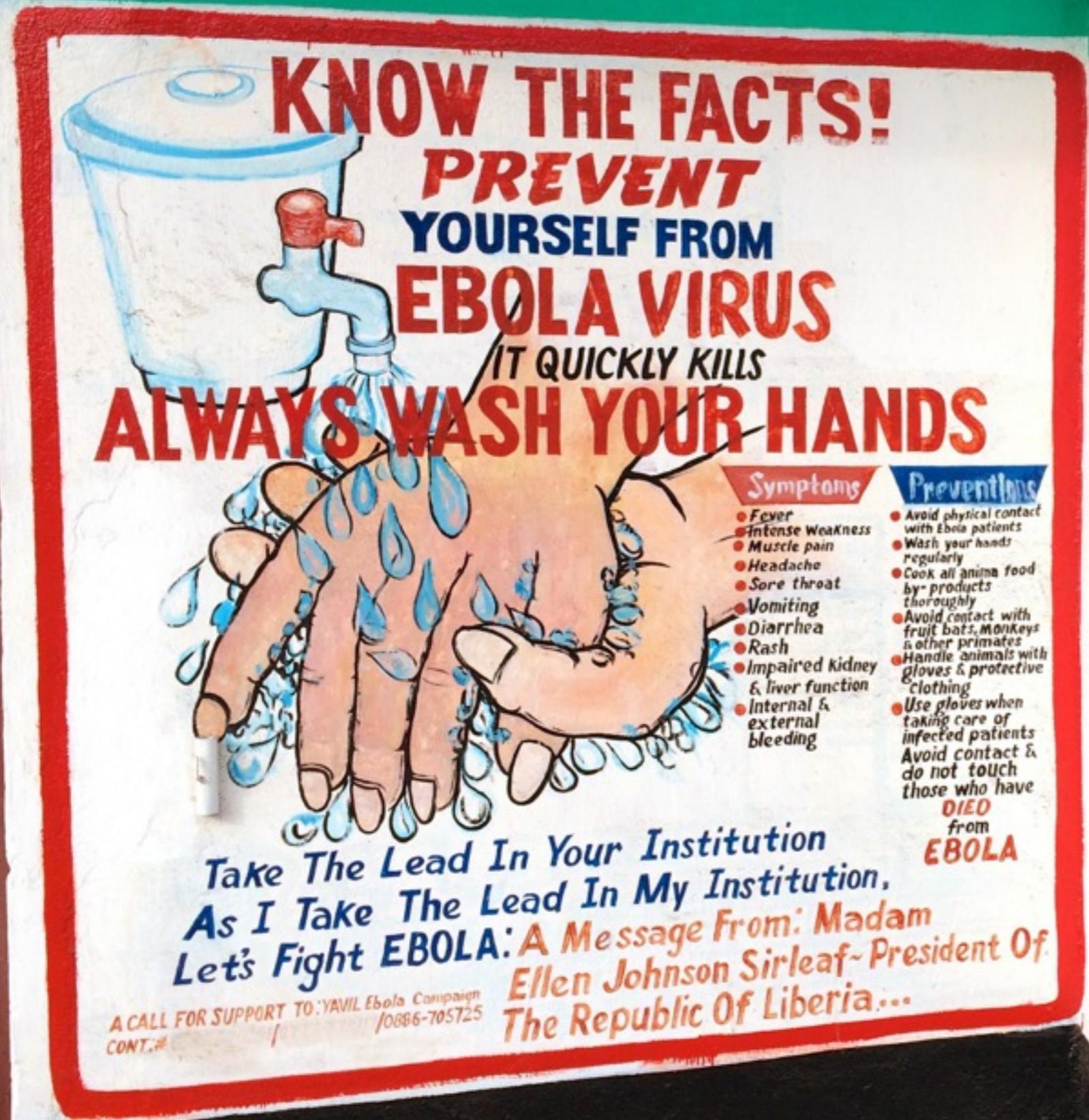
Good Tech for Hard Places: Fighting Ebola with Javascript Offline Apps

Patricia Garcia @patggs

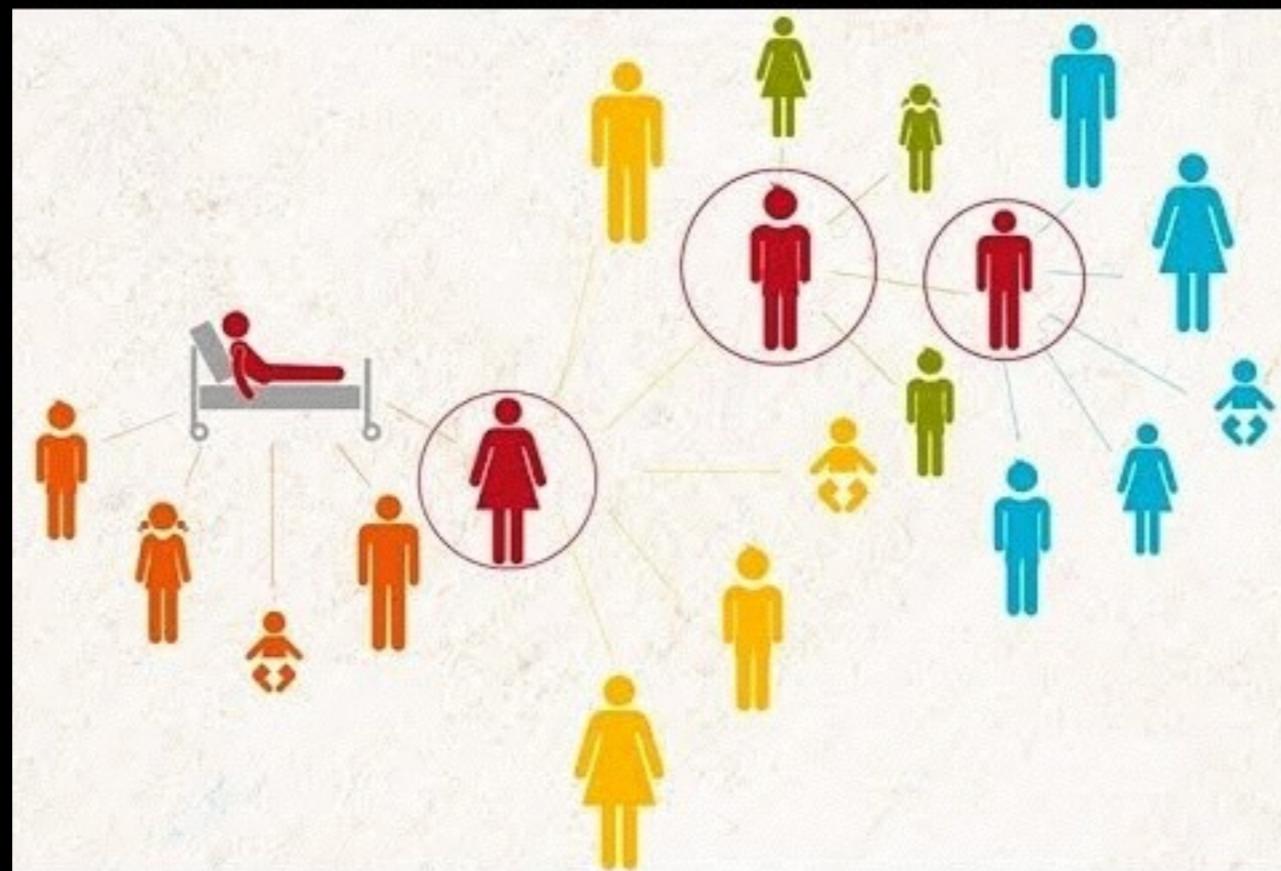


Say what?

- No confirmed treatment yet
- Contagion is by direct contact with body fluids of an infected person, no airborne
- Infected person is contagious only after developing symptoms
- Incubation period is up to 21 days



Contact tracing



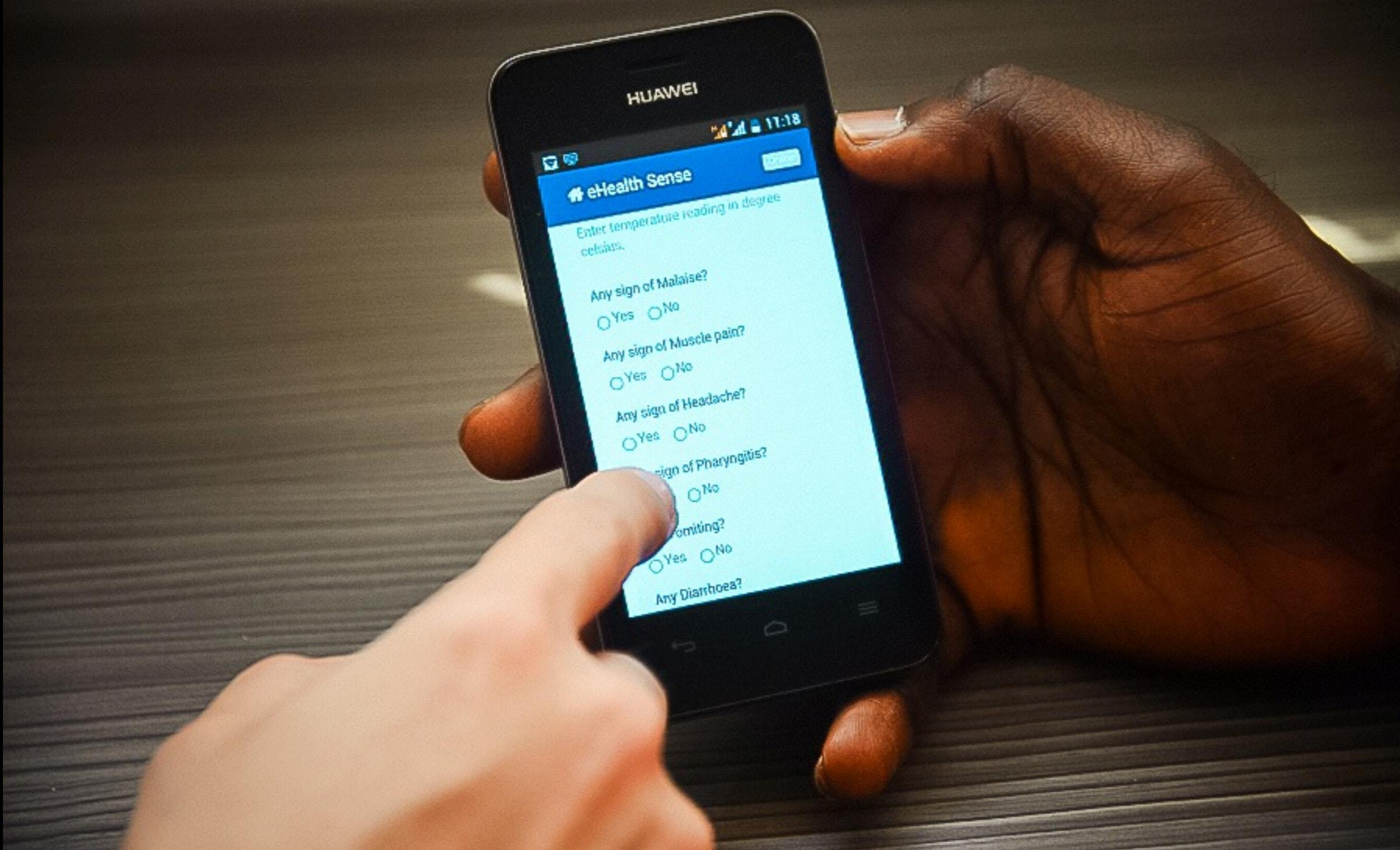


If you suspect
someone with
EBOLA,
Please Call 117
immediately.

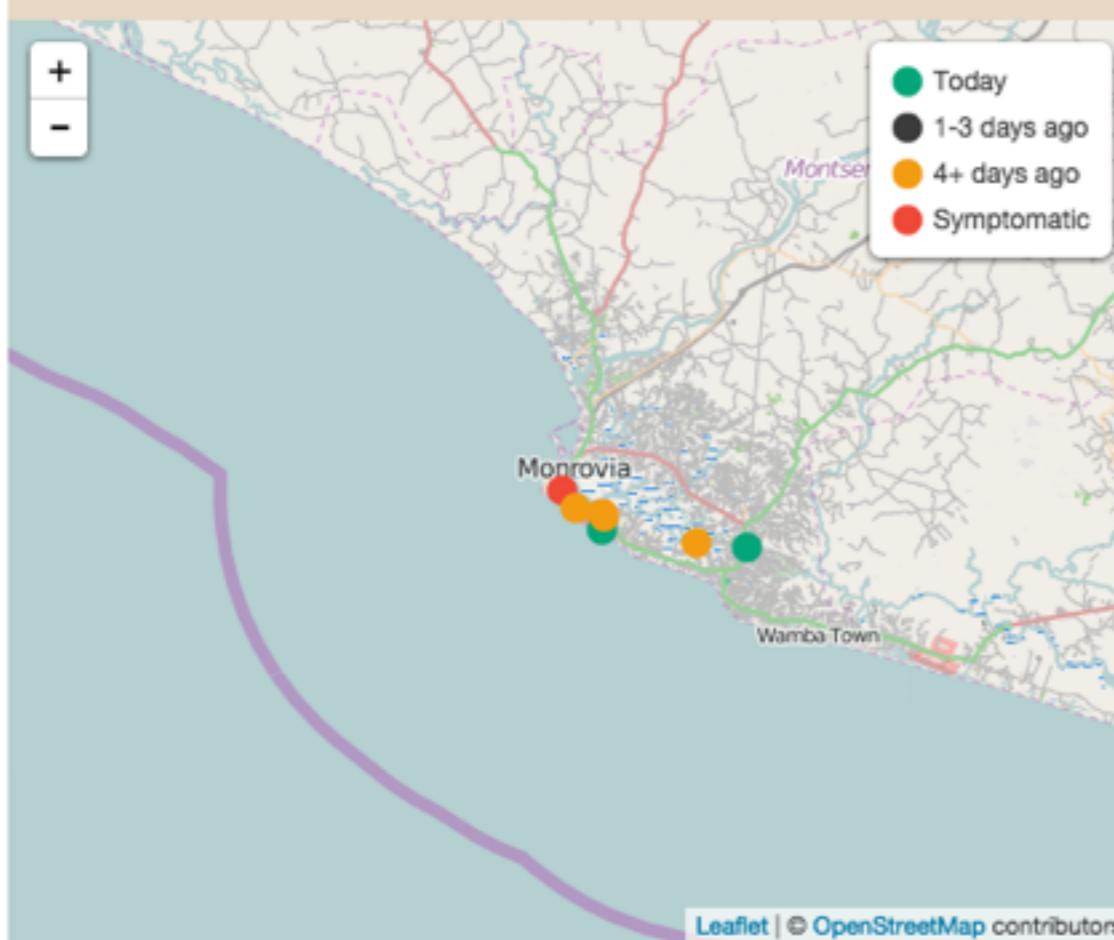
China CDC







Follow Ups on Contacts



Follow Ups on Contacts

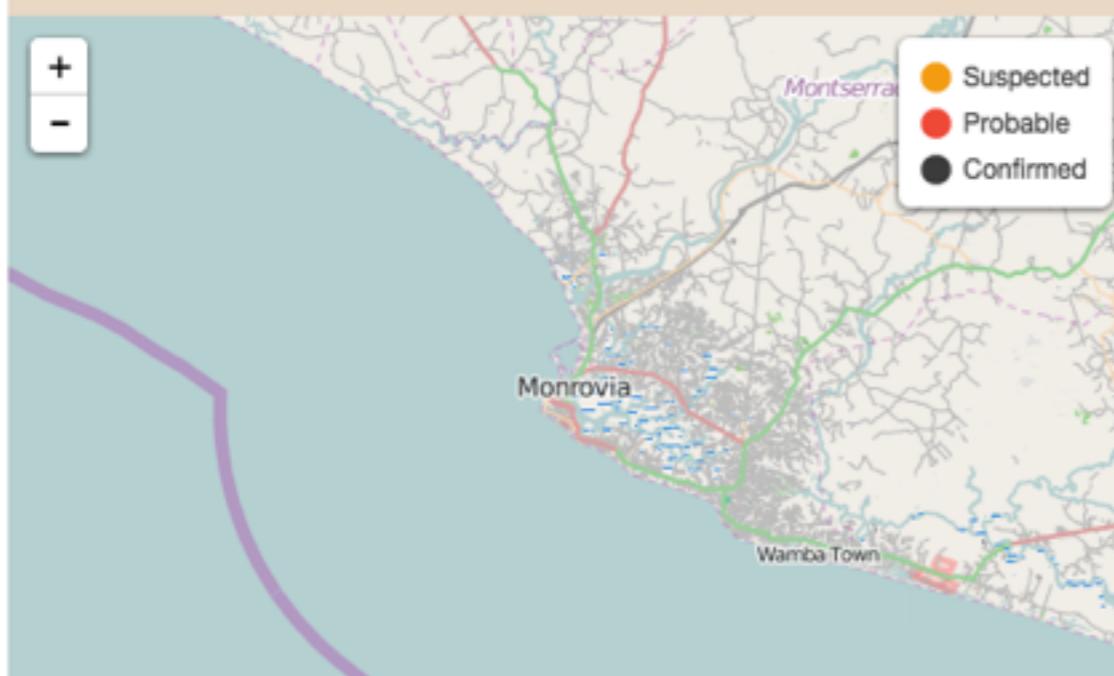
[All contacts CSV](#)
[Daily follow-up CSV](#)

Name	Time ▾	Interviewer	Temp	Mu	Mal	V	D	He	Re	P	Ha	Other
Helen Thomas	Mar 17, 2015	francesco	—	—	—	—	—	—	—	—	—	—
Helen Thomas	Mar 17, 2015	francesco	38	—	—	—	—	—	—	—	—	—
Alex Watila	Mar 17, 2015	riders name	36.9	—	—	—	—	—	—	—	—	—
Michael Wesseh	Mar 17, 2015	Francesco Kirchhoff	36.8	—	—	—	—	—	—	—	—	—
Bessie Wheeler	Mar 17, 2015	Francesco Kirchhoff	—	—	—	—	—	—	—	—	—	—
Stephen Dedalus	Mar 17, 2015	Francesco Kirchhoff	37.6	✓	—	—	✓	—	—	—	—	—
Alex Watila	Mar 17, 2015	Francesco Kirchhoff	36.8	—	—	—	—	—	—	—	—	—
Alex Watila	Mar 14, 2015	riders name	—	—	—	—	—	—	—	—	—	—
Alex Watila	Mar 14, 2015	riders name	36.9	—	—	—	—	—	—	—	—	—
Bessie Wheeler	Mar 13, 2015	Francesco Kirchhoff	—	—	—	—	—	—	—	—	—	—

Showing rows 1-10 of 577

[← Previous](#) [Next →](#)

Cases



Symptomatic

No records available

DIGNIFIED BURIAL MANAGEMENT

QUARANTINE
MANAGEMENT

DEATHS		TRANSPORTATION AND RELIEF	
1	2	3	4
5	6	7	8
9	10	11	12
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17	18	19	20
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Sorry NO
INTERNET Today

CouchDB to the rescue!

Apache CouchDB™ is a database
that uses JSON for documents,
JavaScript for MapReduce indexes,
and regular HTTP for its API



..and designed with distributed
systems in mind

CouchDB can be your backend!!



PouchDB is an open-source JavaScript database inspired by Apache CouchDB that is designed to run well within the browser

It enables applications to store data locally while offline, then synchronize it with CouchDB when the application is back online.



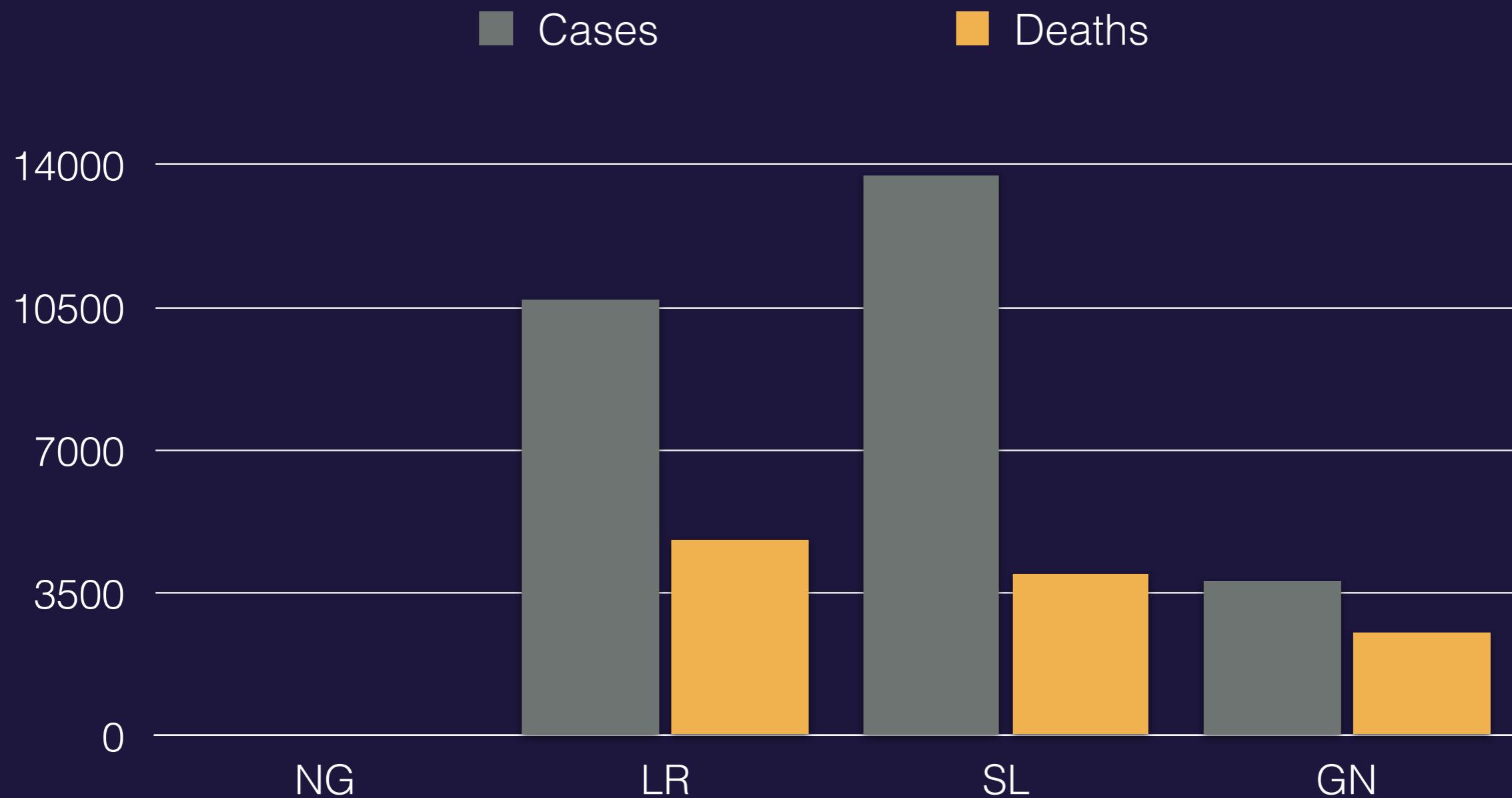
- First prototypes of contact tracing and call center apps were ready in **three** (crunch time) days
- Both were in production within a week

Problems ahead...



“I have no idea what I’m doing”

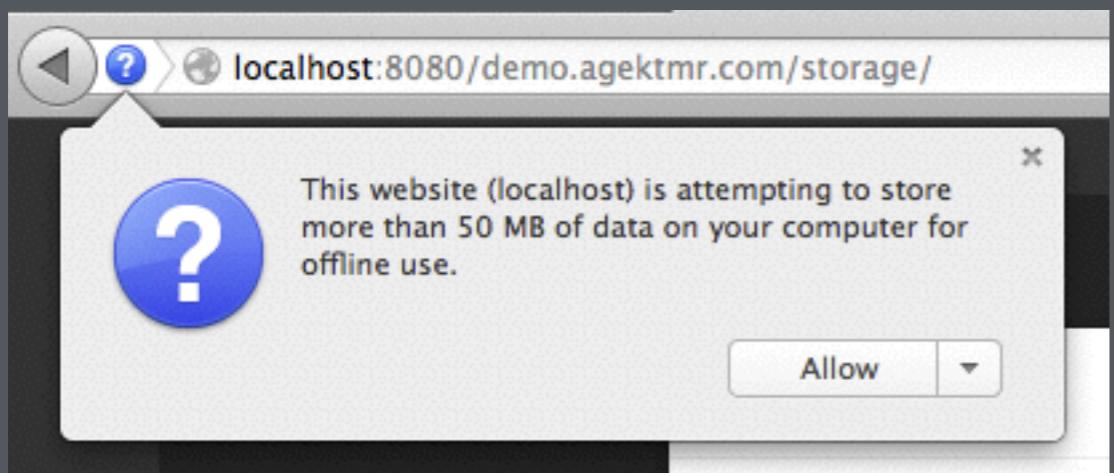
Scaling prototypes



```
PouchDB.sync('mydb', 'http://localhost:5984/mydb', {  
  live: true  
});
```

Not enough space

Browsers limit for IndexedDB:



- Firefox: prompt at 50 MB
- IE 10+: prompt at 10 MB, hard limit of 250 MB
- Chrome: 6.66 % of hard drive free space
- ...

Slow replication

Loading... Please Wait



Replicating whole DB

- Takes too much space
- Replication is too slow

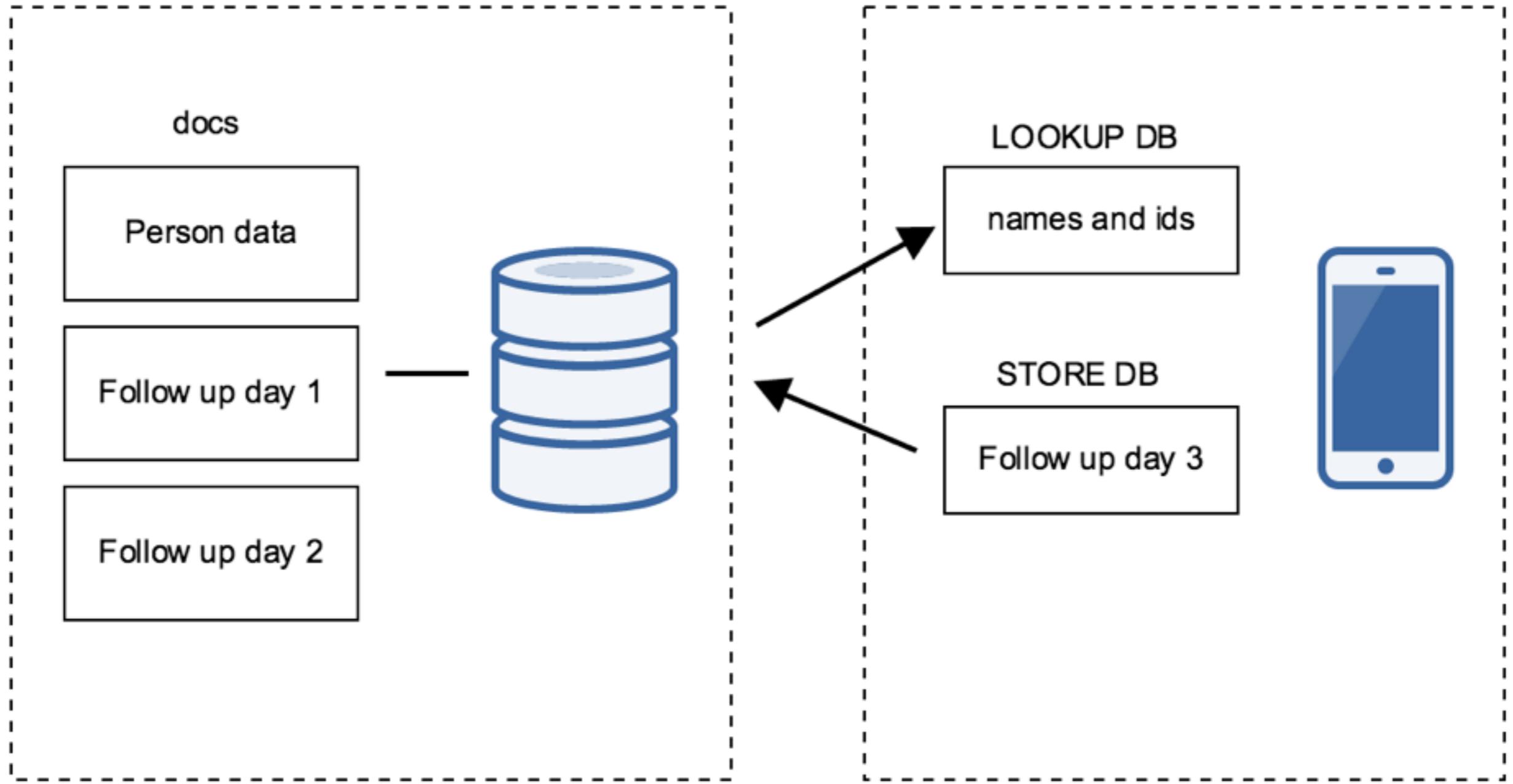
Is it really needed?

Use your domain
knowledge!

Contact tracing mobile app

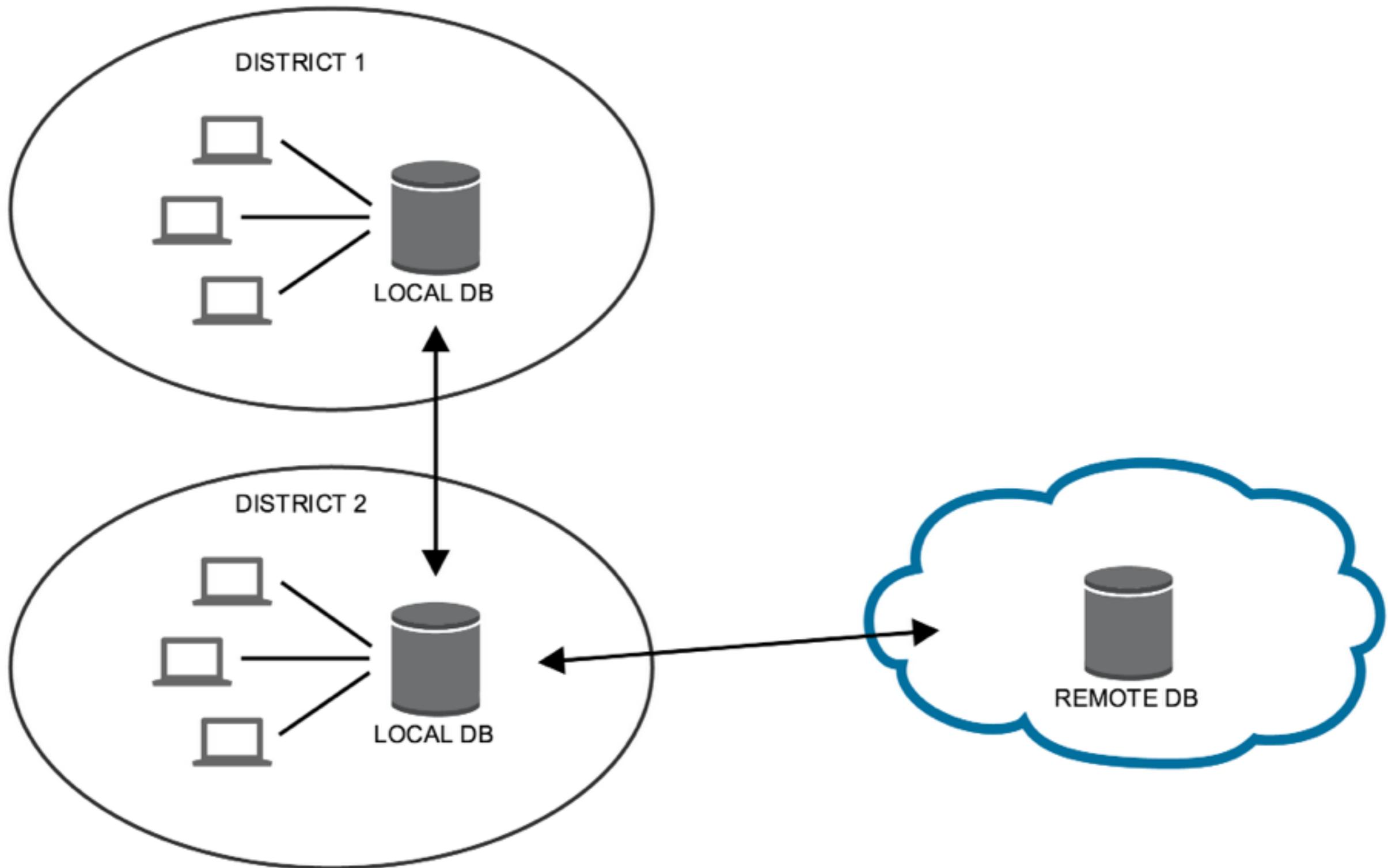
Which docs do we need in the local database?

- contacts created less than 21 days ago
- in my area
- not infected
- from those only the names and ids!



Call center

- Needed dataset much bigger than for contact tracing app
- Slow replication can make the process slower than just using paper

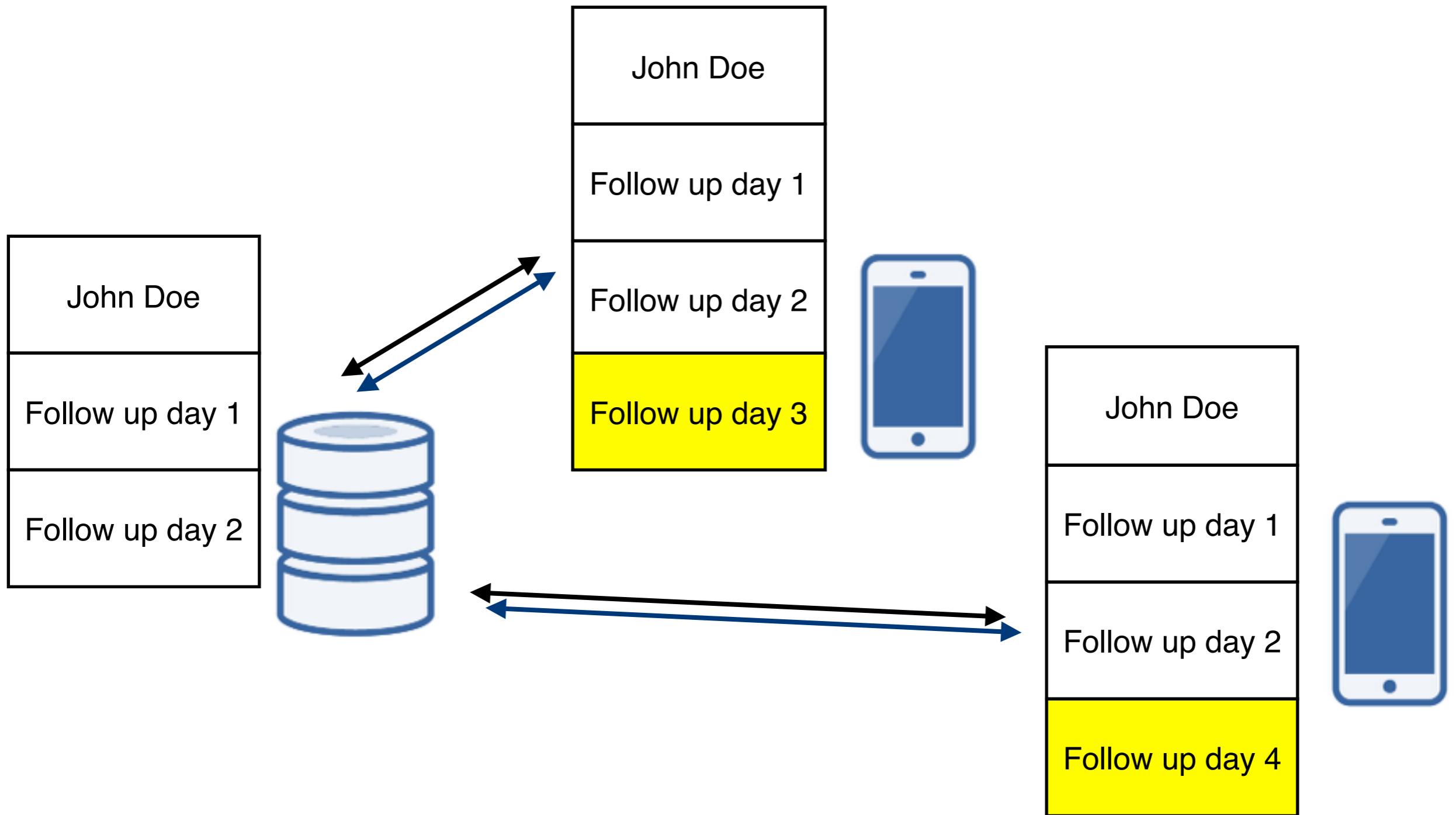


Solve real world problems

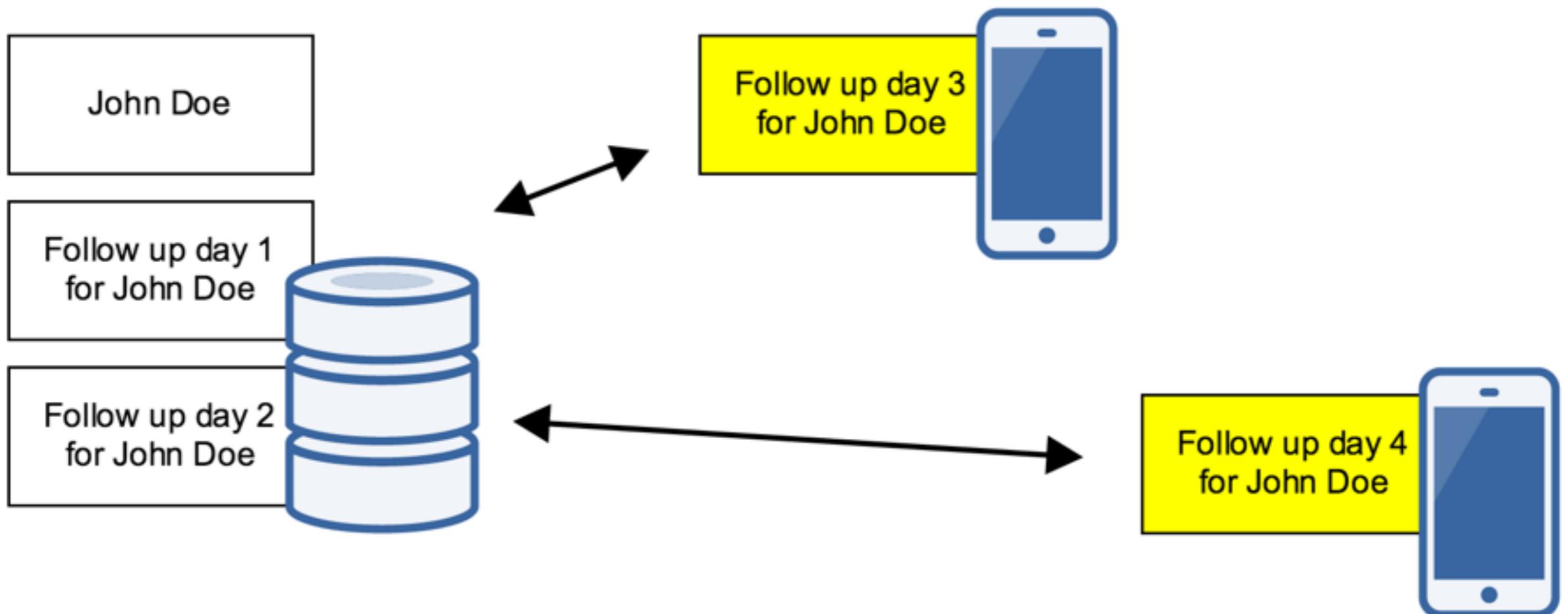
.. i.e. replicate only what you need

Conflicts





- Avoids conflicts
- Less versions per doc:
 - improves replication performance
 - use less storage



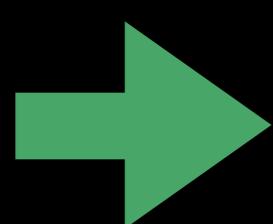
Choose your data
model wisely

Data loss



IndexedDB: temporary storage!

(Chrome)



When running out of temporary storage: ENTIRE data stored for the least recently used host gets deleted

https://developer.chrome.com/apps/offline_storage#temporary

No internet at all



- Local databases?
- Peer to peer replication between devices?
(<http://thaliproject.org/>)

Early Video Dating



Image: AP

State of the art tech

Get an expert if you
can

West Africa Ebola Outbreak

- **Liberia:** 3 new cases on the week to 29 November
- **Guinea:** 1 new case on 29th of October
- **Sierra Leone:** outbreak ended Nov 15
- **Nigeria:** outbreak ended Oct 14

Bye Bye Ebola

“Eventually—though no one can say when—the Ebola fighters are going to be victorious. The fog will clear, leaving the hard truth in view: this won’t be the last epidemic. And when the next one comes, the world must learn the lessons of this one: be better prepared, less fearful, less reactive. Run toward the fire and put it out together. “

Time Magazine, December 10, 2014, “The Ebola Fighters: The Ones Who Answered The Call”



Thanks!

@patggs