



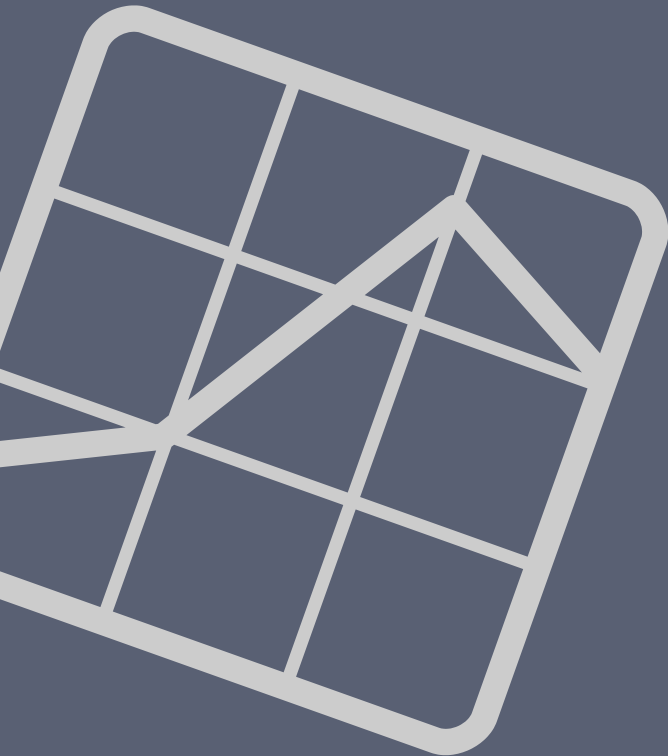
# Fjelltopp

Technology with impact.

## IEES training

Mix Kundegorski, Antananarivo, May 2018

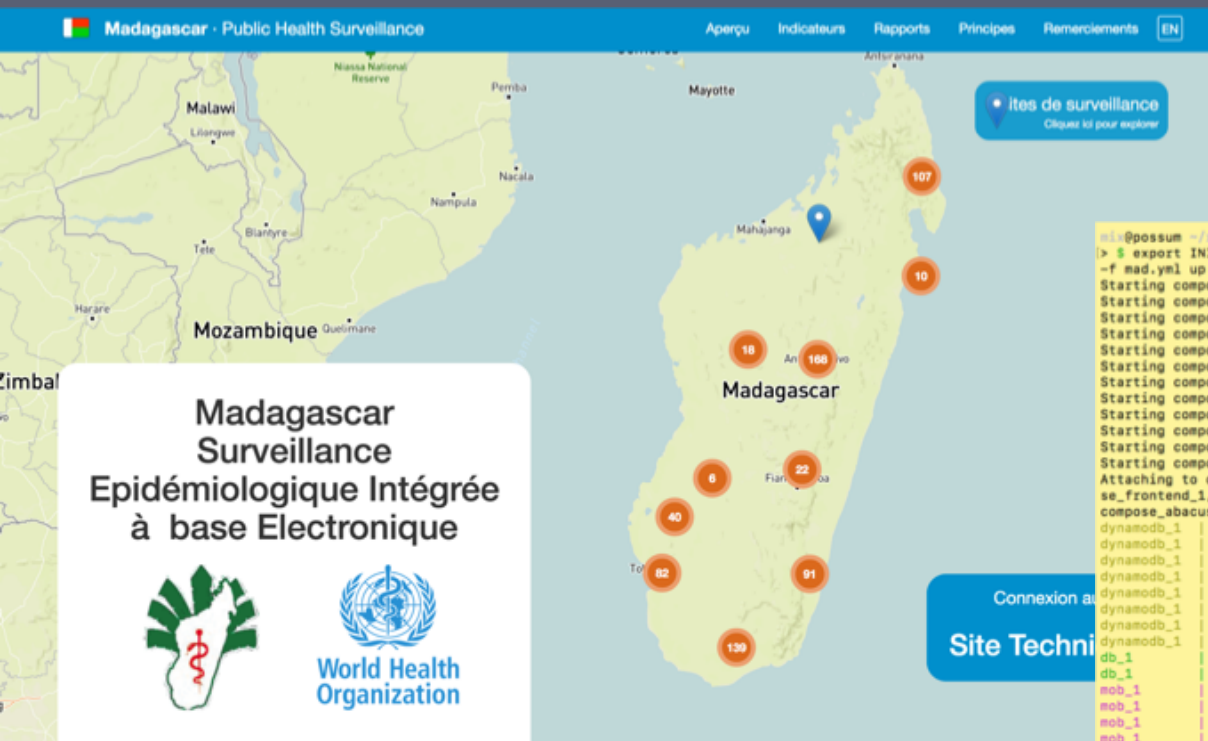
*kundegorski@fjelltopp.org*



- **Today:**
  - Extended review of previous training content.
  - API and technical use of IEES
- **Tomorrow:** Form design and workflow
- **Friday: TBD** (To Be Decided)

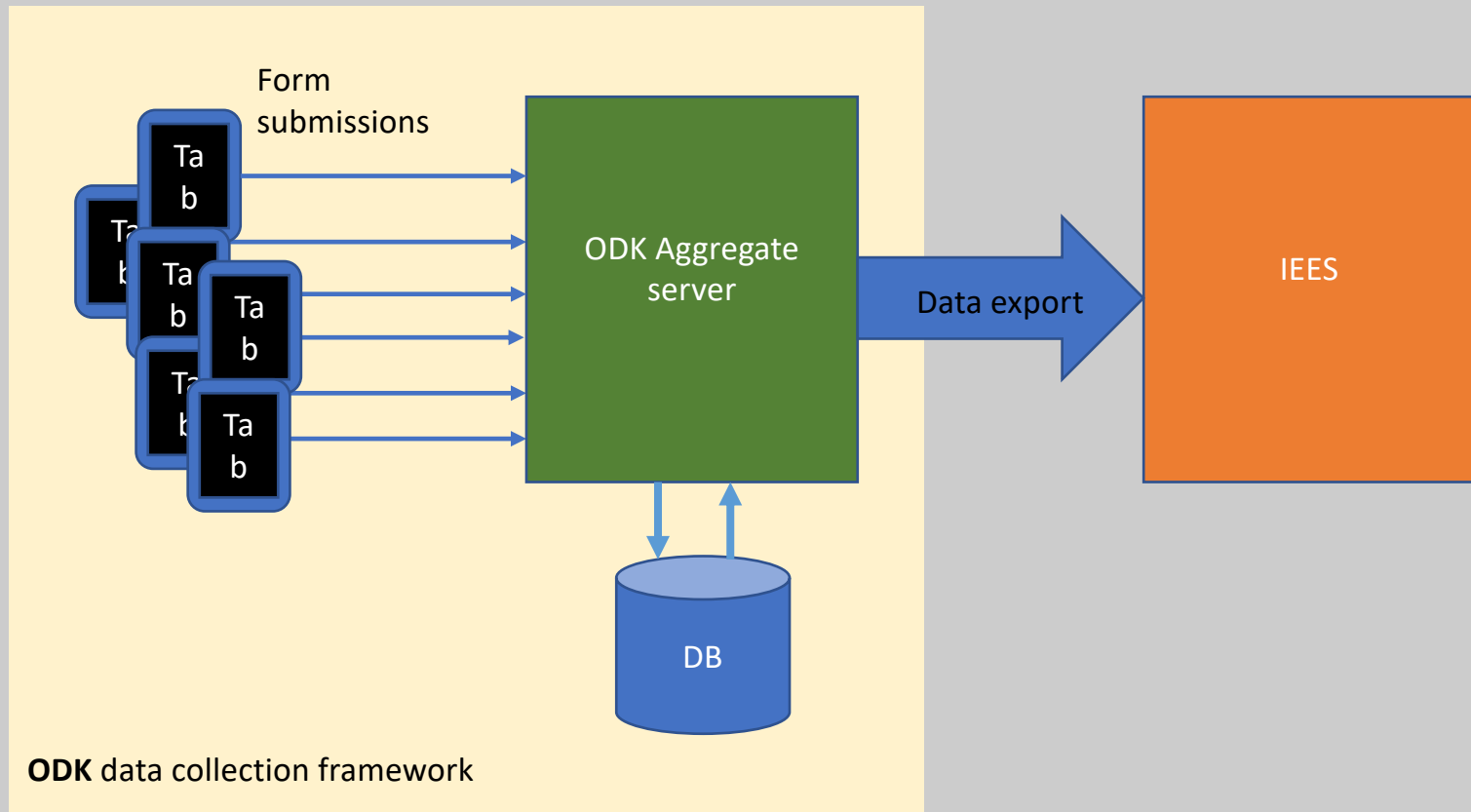
- Doing is better than listening.
- Slow is better than fast.
- All training resources should be freely available on the internet.
- Teaching should not be abstract – all ideas and exercises should be explicitly and directly related back to IEES, with live examples where possible.
- Focus on the goals of the training – maintaining and developing IEES, inspiring and improving understanding of IEES.

# System overview

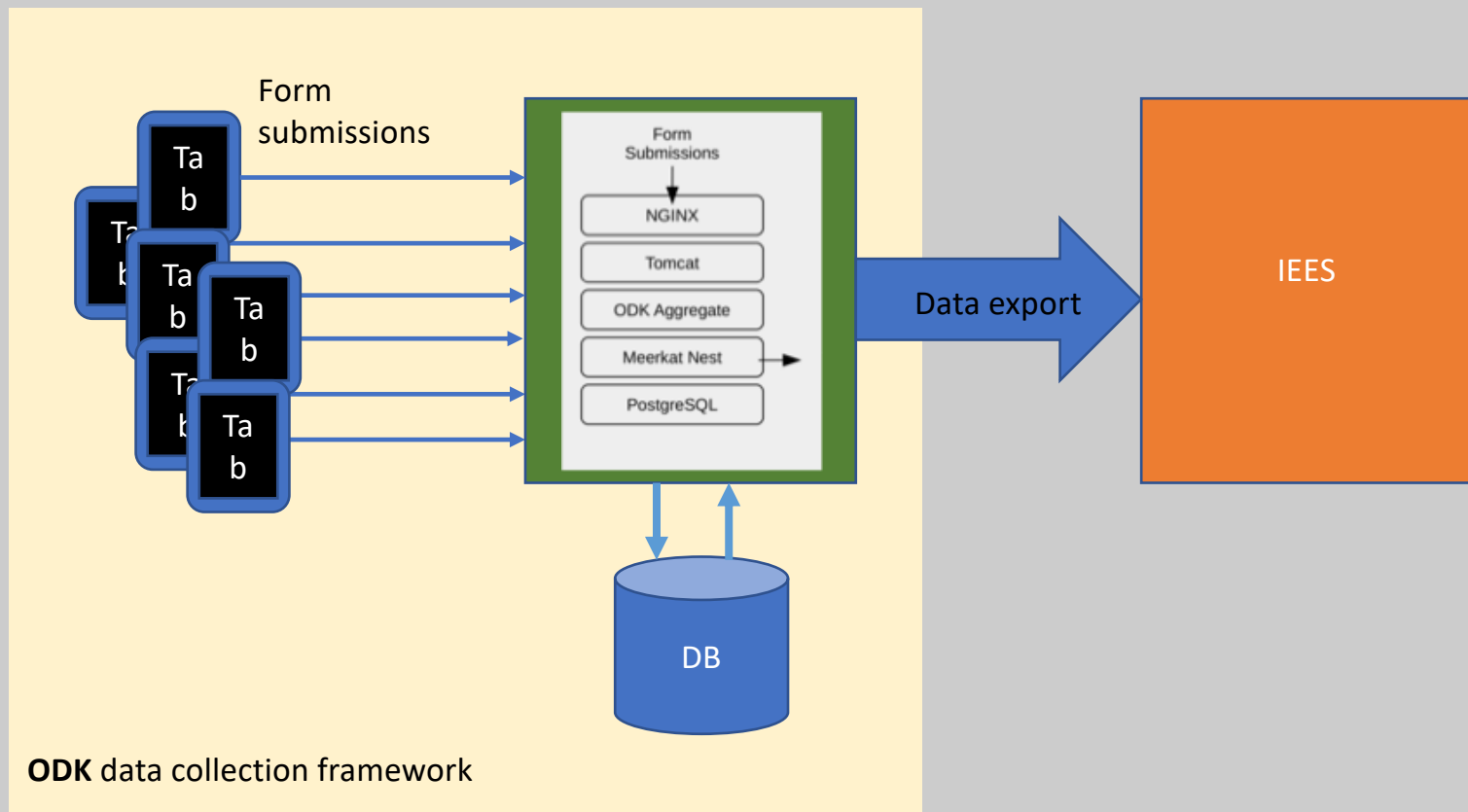


```
mi@possum ~/repos/meerkat/meerkat_dev/compose [7:49:09]
> $ export INITIAL_DATA_SOURCE=FAKE_DATA && export STREAM_DATA_SOURCE=NO_STREAMING && docker-compose
-f mad.yml up
Starting compose_auth_1 ... done
Starting compose_frontend_1 ... done
Starting compose_dynamodb_1 ... done
Starting compose_mob_1 ... done
Starting compose_rabbit_1 ... done
Starting compose_db_1 ... done
Starting compose_hermes_1 ... done
Starting compose_api_1 ... done
Starting compose_abacus_1 ... done
Starting compose_runner_1 ... done
Starting compose_nginx_1 ... done
Starting compose_consul_1 ... done
Attaching to compose_auth_1, compose_dynamodb_1, compose_db_1, compose_mob_1, compose_rabbit_1, comp
se_frontend_1, compose_hermes_1, compose_api_1, compose_runner_1, compose_consul_1, compose_nginx_1,
compose_abacus_1
dynamodb_1 Initializing DynamoDB Local with the following configuration:
dynamodb_1 Port: 8000
dynamodb_1 InMemory: false
dynamodb_1 DbPath: /var/dynamodb_local
dynamodb_1 SharedDb: false
dynamodb_1 shouldDelayTransientStatuses: false
dynamodb_1 CorsParams: *
db_1 2018-05-08 04:49:44.153 UTC [1] LOG: listening on IPv4 address "0.0.0.0", port 5432
db_1 2018-05-08 04:49:44.153 UTC [1] LOG: listening on IPv6 address "::", port 5432
[mob_1] getting INI configuration from /var/www/uwsgi/app.ini
*** Starting uWSGI 2.0.17 (64bit) on [Tue May 8 04:49:43 2018] ***
compiled with version: 4.9.2 on 26 March 2018 09:24:11
os: Linux-4.9.87-linuxkit-aufs #1 SMP Wed Mar 14 15:12:16 UTC 2018
nodename: mob
machine: x86_64
clock source: unix
pcrre jit disabled
detected number of CPU cores: 4
current working directory: /var/www/meerkat_mob
detected binary path: /usr/local/bin/uwsgi
uWSGI running as root, you can use --uid/--gid/--chroot options
*** WARNING: you are running uWSGI as root !!! (use the --uid flag) ***
your memory page size is 4096 bytes
detected max file descriptor number: 1048576
lock engine: pthread robust mutexes
2018-05-08 04:49:44.180 UTC [1] LOG: listening on Unix socket "/var/run/postgresql/.s
PGSQL.5432"
mob_1 thunder lock: disabled (you can enable it with --thunder-lock)
```

# Data collection within IEES



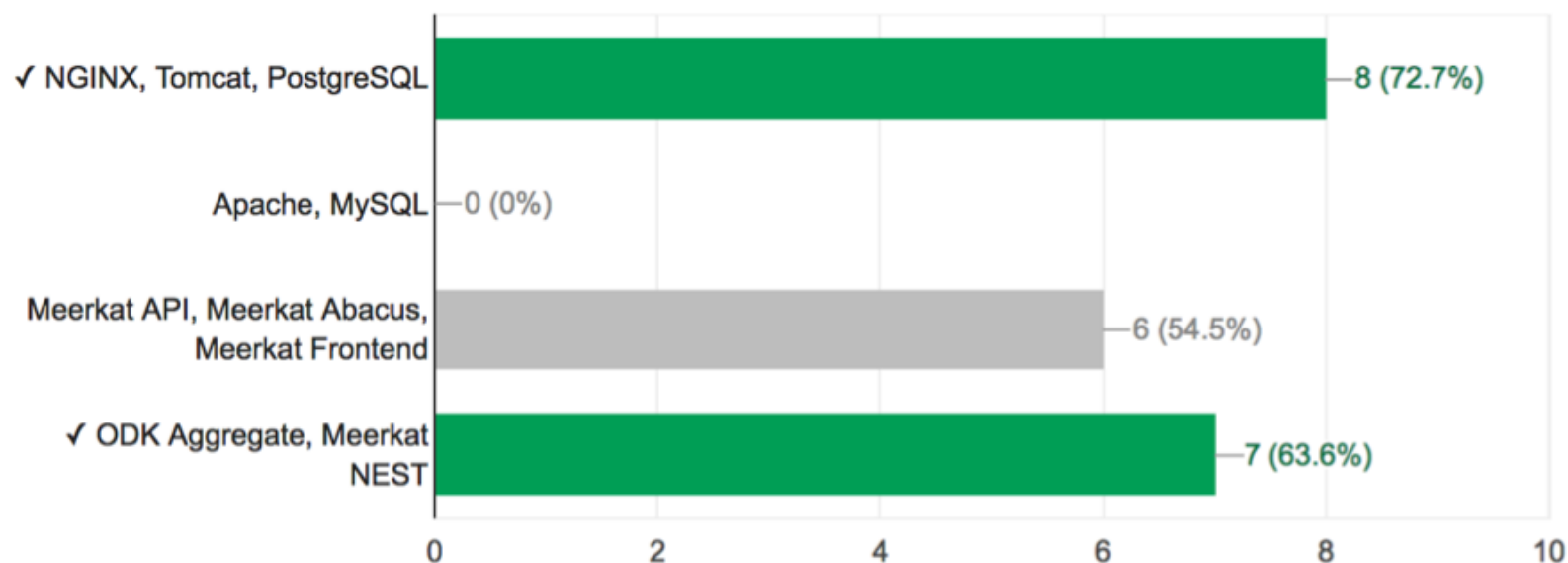
# Data collection within IEES





## What services are used in IEES Data Collection Server?

1 / 11 correct responses

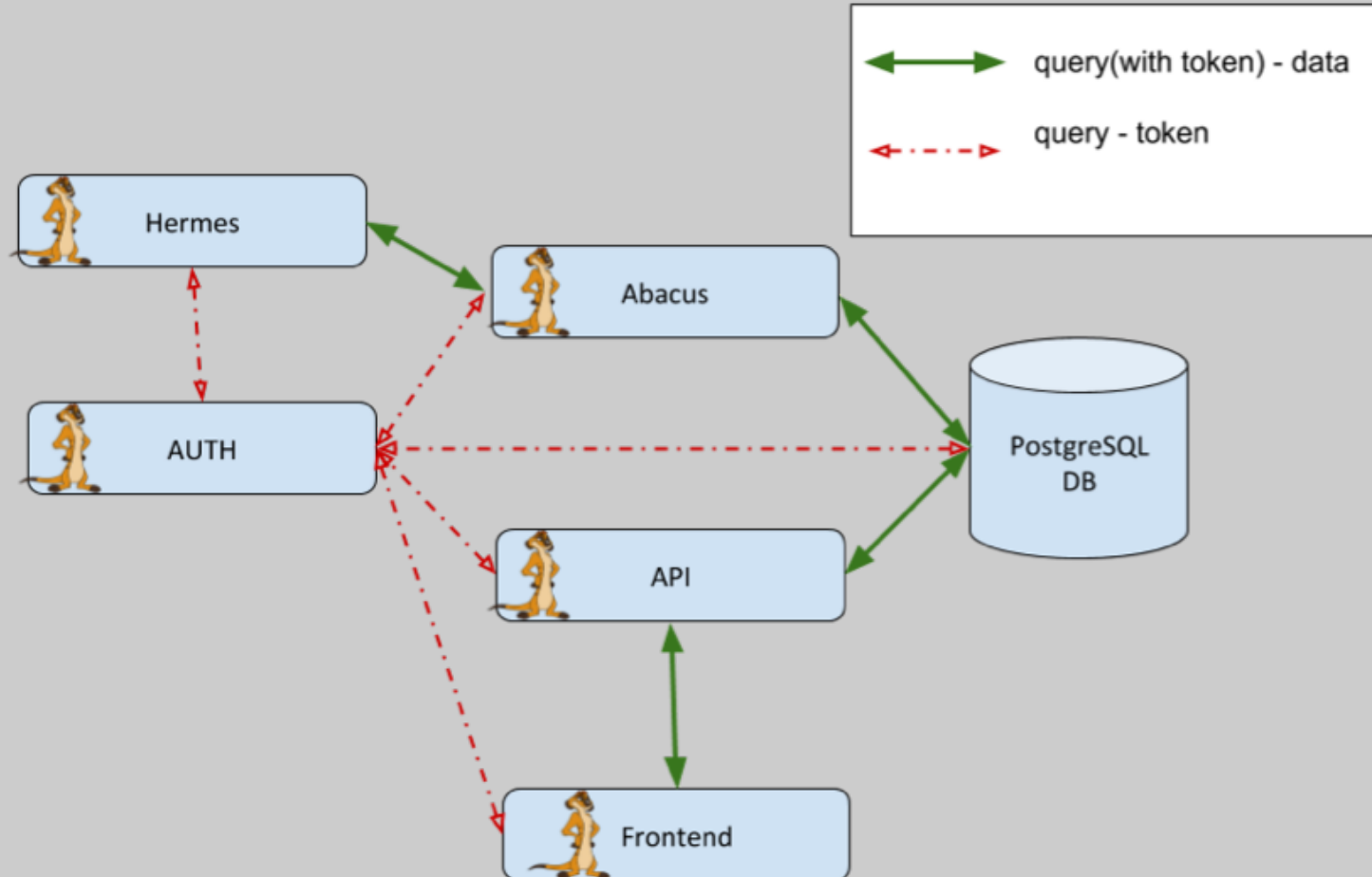


- One of the most popular frameworks (set of computer programs for servers, computers and mobiles) for gathering survey data.
- Used by many governments, UN agencies and NGOs
- Uses Xforms format which is **the** most popular format to store survey questionnaires
- The most flexible and fairly easy way to generate Xforms is using XLSForms which allow creating definitions in Excel



- ODK: Allows quick and easy data gathering in small and medium sized surveys with little analysis. Can be deployed within few days.
- DHIS2: Complex and powerful system for data gathering analysis and reporting. Requires months of integration and trainings

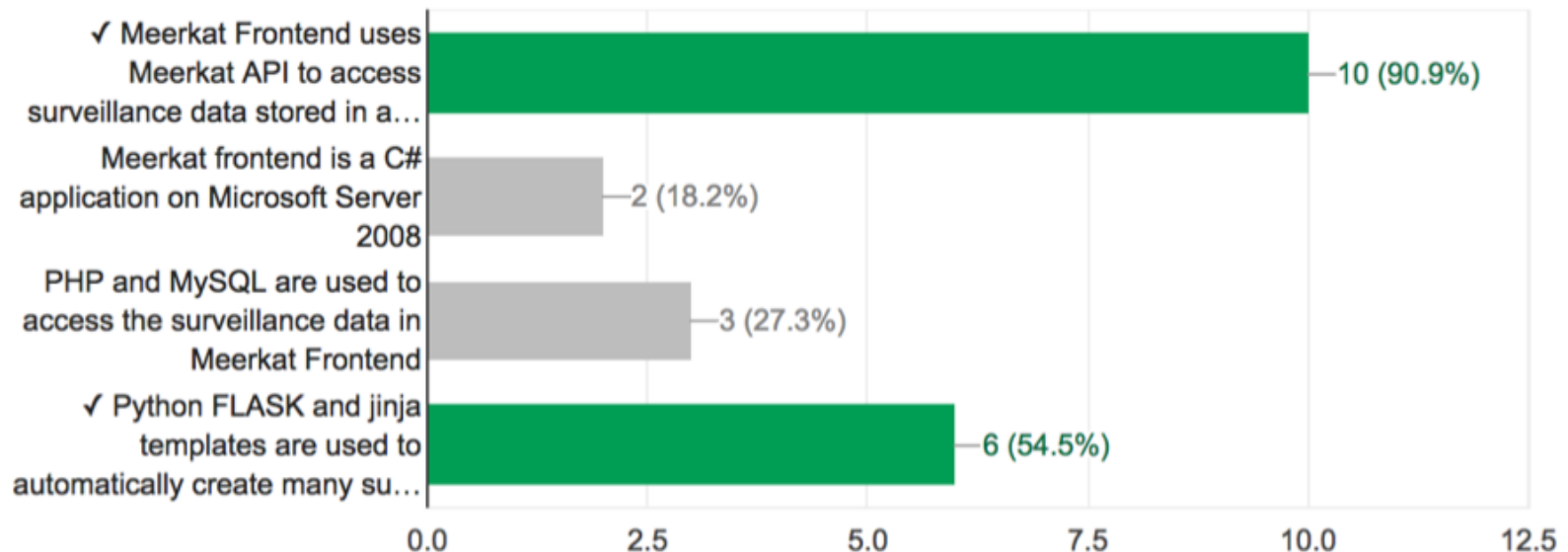
# IEES reporting server



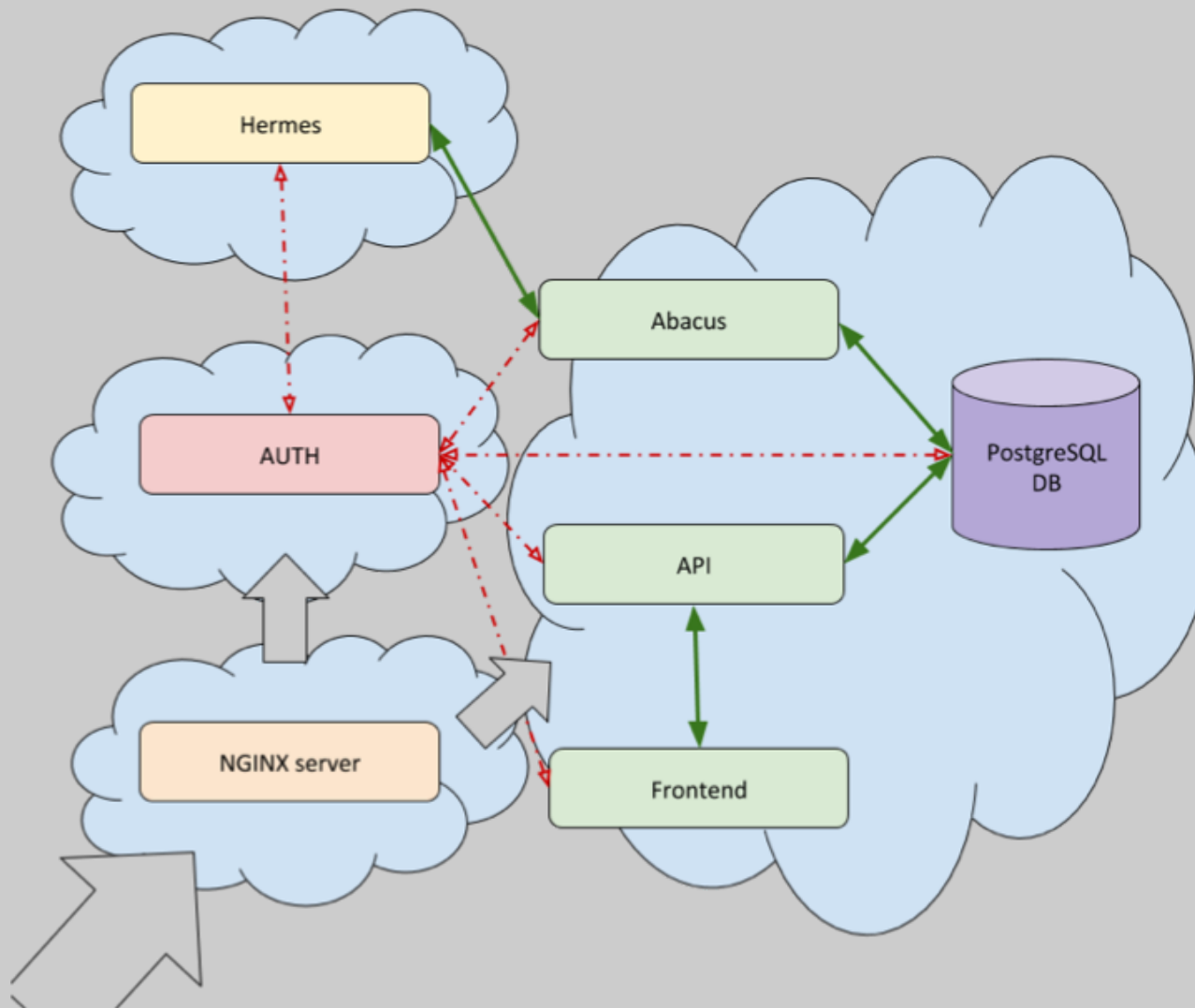


## Which of the following are true?

3 / 11 correct responses



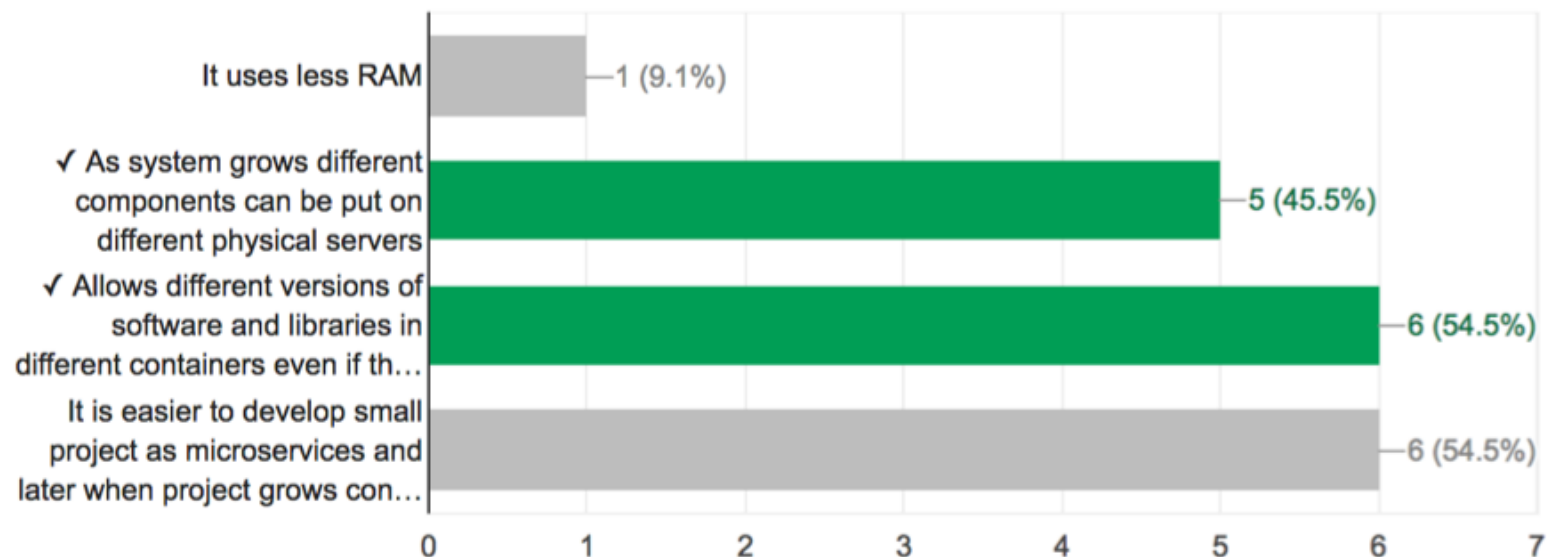
# IEES in the cloud





## IEES uses 16 docker micro services. Why it is better than having one macro service?

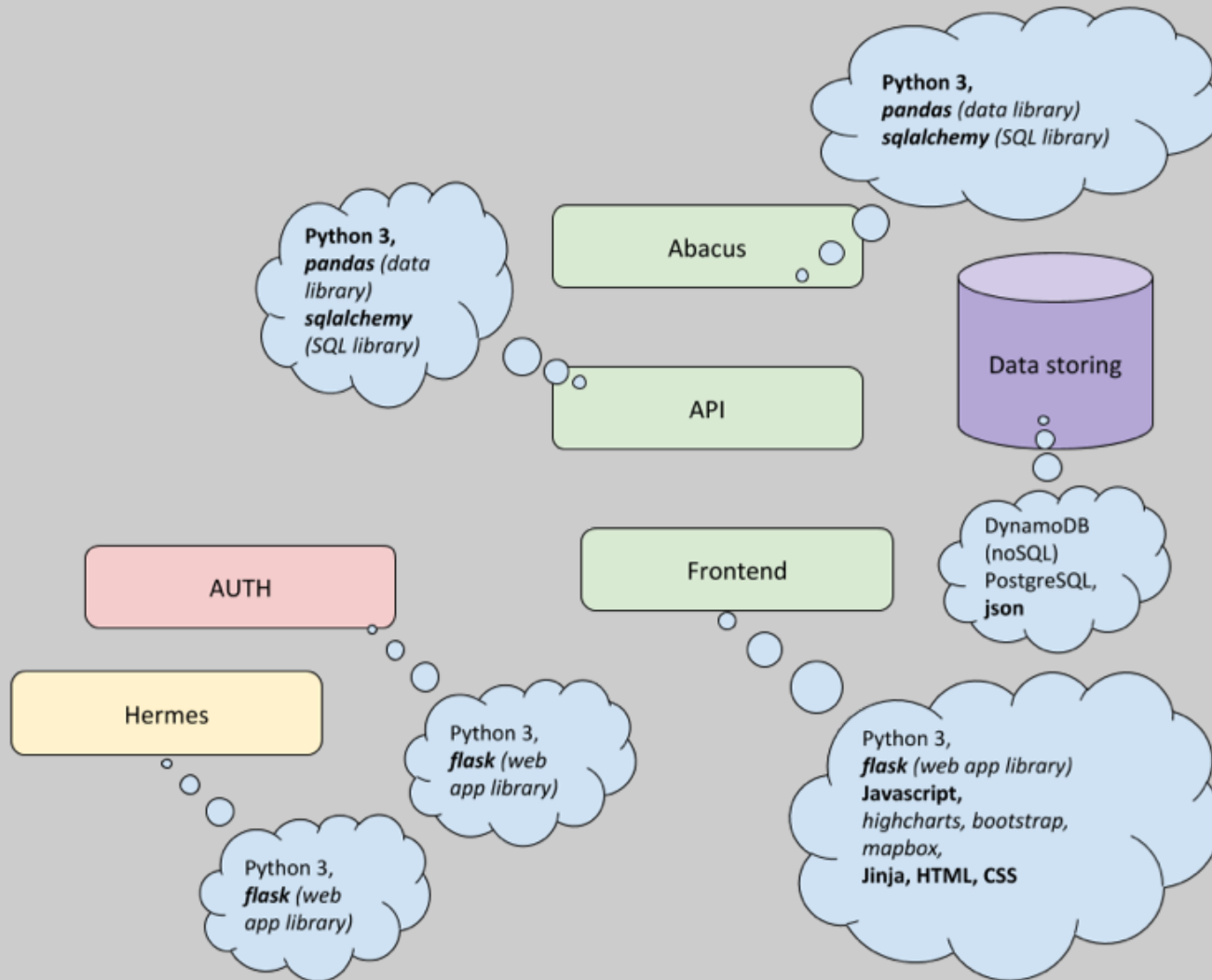
1 / 11 correct responses



# IEES reporting server



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# Docker...

MAN, DOCKER IS BEING USED FOR EVERYTHING.  
I DON'T KNOW HOW I FEEL ABOUT IT.  
STORY TIME!



ONCE, LONG AGO, I WANTED TO USE AN OLD TABLET AS A WALL DISPLAY.



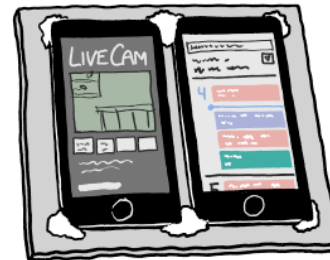
I HAD AN APP AND A CALENDAR WEBPAGE THAT I WANTED TO SHOW SIDE BY SIDE, BUT THE OS DIDN'T HAVE SPLIT-SCREEN SUPPORT.  
SO I DECIDED TO BUILD MY OWN APP.



I DOWNLOADED THE SDK AND THE IDE, REGISTERED AS A DEVELOPER, AND STARTED READING THE LANGUAGE'S DOCS.



...THEN I REALIZED IT WOULD BE WAY EASIER TO GET TWO SMALLER PHONES ON EBAY AND GLUE THEM TOGETHER.



ON THAT DAY, I ACHIEVED SOFTWARE ENLIGHTENMENT.

BUT YOU NEVER LEARNED TO WRITE SOFTWARE.

NO, I JUST LEARNED HOW TO GLUE TOGETHER STUFF THAT I DON'T UNDERSTAND.

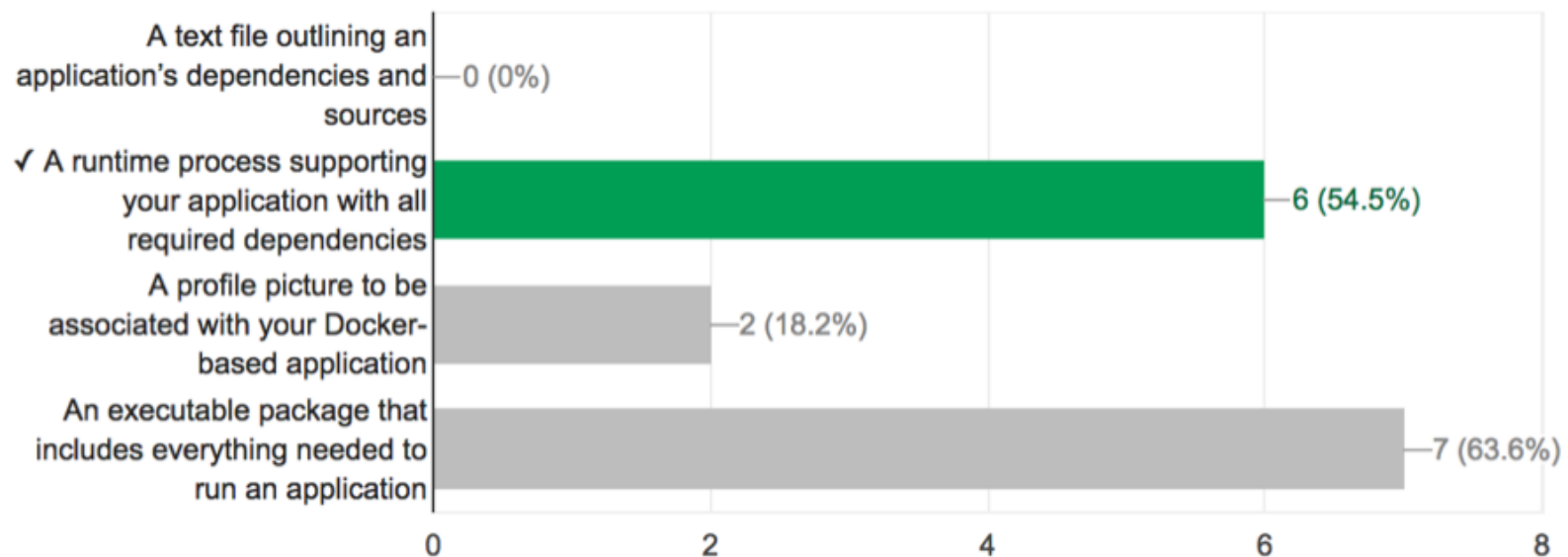
I...OK, FAIR.





## A Docker image is...

2 / 11 correct responses





# Data processing: Form submission



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```
1  {
2    "cd./malaria_type": "simple",
3    "malaria2./malaria_rdt_precise": "101",
4    "visit": "referral",
5    "cd./plague_type": "A20.2",
6    "cd./malaria_rx": "yes",
7    "SubmissionDate": "2018-05-07T15:51:54.118401",
8    "cd./malaria_type2": "imported",
9    "child_age": "28",
10   "pregnancy_complications": "yes",
11   "malaria2./l1in": "yes_other",
12   "index": "1",
13   "pt./gender": "female",
14   "end": "2018-05-06T18:43:46.665920",
15   "vaccination": "no",
16   "pt./death": "",
17   "malaria./malaria_slide": "",
18   "smoke_now": "no",
19   "malaria2./cpn": "cpn3",
20   "start": "2018-05-06T01:57:27.326084",
21   "vaccination_type": "bcg,measles,tetanus,polio,hepb",
22   "pt1./status": "refugee",
23   "mortality": "A82",
24   "smoke_ever": "yes",
25   "icd_code": "A64",
26   "fever": "no",
27   "meta/instanceID": "uuid:96d283fa-1bb9-4e03-83d2-9cb63ce51601",
28   "intro./module": "rh,imci,px,labs",
29   "malaria./amenorrhea_weeks": "3",
30   "cd./malaria_rdt": "",
31   "pt./age": "97",
32   "nationality": "madagascar",
33   "cd./temperature": "",
34   "pregnant": "yes",
35   "malaria./norx": "notavailable",
36   "pt./visit_date": "2018-04-18T00:00:00",
37   "malaria2./tpi": "tpi3",
38   "deviceid": "868981023654207",
39   "child_age_days": "4",
40   "cd./plague_rdt": "positive",
41   "intro./death": ""
42 }
```

# Data processing: case entry



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meerkat\_db on postgres@meerkat\_db

```
1 SELECT * from public.data where uuid = 'uuid:9db59e21-178e-4be0-b411-8572ec3147bd';
2
```

Data Output										<a href="#">Explain</a>	<a href="#">Messages</a>	<a href="#">Query History</a>
	id integer	uuid character varying	device_id character varying	type character varying	type_name character varying	date timestamp without time zone	epi_week integer	epi_year integer	submission_date timestamp without			
1	305	uuid:9db59e21-178e...	355755086160025	case	Case Report	2018-04-30 00:00:00	18	2018	2018-05-06 21:08:14			
submission_date timestamp without time zone				country integer	zone integer	region integer	district integer	clinic integer	clinic_type character varying			
2018-05-06 21:08:14.104302				1	1	18	118	834	CSB2			
country integer	zone integer	region integer	district integer	clinic integer	clinic_type character varying	case_type text[]	links jsonb	tags jsonb	variables jsonb	categories jsonb	geolocation geometry	
1	1	18	118	834	CSB2	{""}	{}	[]	{"mor_16": "...	{"deaths": "...	01010000001...	

# Data processing: codes



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	A	B	C	D	E	F	G	H	I	J	K	L	M
1	id	name	type	form	multiple_link	db_column	alert	alert_type	method	condition	category	calculation	calculation_f
6	gen_1	Male	case	mad_case		pt./gender			match	male	gender		gender
7	gen_2	Female	case	mad_case		pt./gender			match	female	gender		gender
8	nat_1	Madagascar	case	mad_case		nationality			match	madagascar	nationality		nationality
9	nat_2	Kenya	case	mad_case		nationality			match	kenya	nationality		nationality
10	nat_3	Other Nation	case	mad_case		nationality			match	other	nationality		nationality
11	age_1	<5	case	mad_case		pt./age			between	0,5	age_under_5	pt./age	age
12	age_2	05-Sep	case	mad_case		pt./age			between	5,10	age	pt./age	age
13	age_3	Oct-14	case	mad_case		pt./age			between	10,15	age	pt./age	age
14	age_4	15-19	case	mad_case		pt./age			between	15,20	age	pt./age	age
15	age_5	20-59	case	mad_case		pt./age			between	20,60	age	pt./age	age
16	age_6	>60	case	mad_case		pt./age			between	60, 200	age	pt./age	age
17	age_7	Female <5	case	mad_case		pt./gender;pt./age			match and between	female;0,5	age_gender	None;pt./age	age_gender
18	age_8	Female 5-9	case	mad_case		pt./gender;pt./age			match and between	female;5,10	age_gender	None;pt./age	age_gender
19	age_9	Female 10-14	case	mad_case		pt./gender;pt./age			match and between	female;10,15	age_gender	None;pt./age	age_gender
20	age_10	Female 15-19	case	mad_case		pt./gender;pt./age			match and between	female;15,20	age_gender	None;pt./age	age_gender
21	age_11	Female 20-59	case	mad_case		pt./gender;pt./age			match and between	female;20,60	age_gender	None;pt./age	age_gender
22	age_12	Female >60	case	mad_case		pt./gender;pt./age			match and between	female;60,200	age_gender	None;pt./age	age_gender
23	age_13	Male <5	case	mad_case		pt./gender;pt./age			match and between	male;0,5	age_gender	None;pt./age	age_gender
24	age_14	Male 5-9	case	mad_case		pt./gender;pt./age			match and between	male;5,10	age_gender	None;pt./age	age_gender
25	age_15	Male 10-14	case	mad_case		pt./gender;pt./age			match and between	male;10,15	age_gender	None;pt./age	age_gender
26	age_16	Male 15-19	case	mad_case		pt./gender;pt./age			match and between	male;15,20	age_gender	None;pt./age	age_gender
27	age_17	Male 20-59	case	mad_case		pt./gender;pt./age			match and between	male;20,60	age_gender	None;pt./age	age_gender
28	age_18	Male >60	case	mad_case		pt./gender;pt./age			match and between	male;60,200	age_gender	None;pt./age	age_gender
29	age_19	Child under 2	case	mad_case		child_age			between	0,24	child_under_2	child_age	
30	agv_1	Age	case	mad_case		pt./age			value				
31	agv_2	Age in Months	case	mad_case		child_age			value				
32	prc_1	Communicable	case	mad_case		icd_code			sub_match	A00,A01,A02,A03,A04,A05,A06,A07,A08,A09.0	pc	pt./age	pc
33	prc_2	Non-communicable	case	mad_case		icd_code			sub_match	C00,C01,C02,C03,C04,C05,C06,C07,C08,C09	pc	pt./age	pc
34	prc_3	Mental Health	case	mad_case		icd_code			sub_match	F00,F01,F02,F03,F04,F05,F06,F07,F08,F09	pc	pt./age	pc
35	prc_4	Reproductive	case	mad_case		icd_code			sub_match	O00,O01,O02,O03,O04,O05,O06,O07,O08,O09	pc	pt./age	pc
36	prc_5	Injury	case	mad_case		icd_code			sub_match	S00,S01,S02,S03,S04,S05,S06,S07,S08,S09	pc	pt./age	pc
37	prc_6	Other	case	mad_case		icd_code			sub_match	I00,I01,I02,I03,I04,I05,I06,I07,I08,I09	pc	pt./age	pc
38	cmd_1	Acute Diarrhoea	case	mad_case		icd_code;mortality		double	match or match	A09.0;A09.1	cd_tab,Intestinal infectious diseases		cd_tab,Intestinal infectious diseases
39	cmd_2	Cholera	case	mad_case		icd_code;mortality		double	match or match	A00,A00.0,A00.1,A00.9;A00,A00.0,A00.1,A00.9	cd_tab,Intestinal infectious diseases		cd_tab,Intestinal infectious diseases
40	cmd_3	Typhoid Fever	case	mad_case		icd_code;mortality		double	match or match	A01,A01.0,A01.1,A01.2,A01.3,A01.4,A01.5,A01.6,A01.7,A01.8,A01.9	cd_tab,Intestinal infectious diseases		cd_tab,Intestinal infectious diseases
41	cmd_4	Bloody Diarrhoea	case	mad_case		icd_code;mortality		double	match or match	A03,A03.0,A03.1,A03.2,A03.3,A03.8,A03.9	cd_tab,Intestinal infectious diseases		cd_tab,Intestinal infectious diseases

# Data processing: codes

old data

A	B	F	G	H	I	
id	name	db_column	alert	alert_type	method	condition
gen_1	Male	pt./gender			match	male
gen_2	Female	pt./gender			match	female

same codes  
for new  
form from  
different  
system

gen_1	Male	/section/1/Sexe		match	M
gen_2	Female	/section/1/Sexe		match	F

# Data processing: codes



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```
46 {  
47   "mor_16": 1,  
48   "alert_type": "individual",  
49   "prc_1": 1,  
50   "vac_11": 1,  
51   "mls_31": 1,  
52   "vac_6": 1,  
53   "mod_5": 1,  
54   "vac_4": 1,  
55   "vac_5": 1,  
56   "mod_1": 1,  
57   "pla_3": 1,  
58   "alert_received": "2018-05-06T21:08:14.104302",  
59   "vac_8": 1,  
60   "icb_9": 1,  
61   "alert_reason": "alert_cmd_10",  
62   "alert_cmd_10": 1,  
63   "alert_age": "76",  
64   "alert_submitted": "2018-05-06T16:20:33.493759",  
65   "mls_48": 1,  
66   "mal_2_a": 1,  
67   "nat_2": 1,  
68   "gen_2": 1,  
69   "vac_9": 1,  
70   "submission_date": "2018-05-06T21:08:14",  
71   "alert_gender": "female",  
72   "mls_subtype_23": 1,  
73   "mls_29": 1,  
74   "mls_subtype_25": 1,  
75   "mls_subtype_27": 1,  
76   "mls_24": 1,  
77   "mls_27": 1,  
78   "data_entry": 1,  
79   "alert": 1,  
80   "age_6": 1,  
81   "age_12": 1,  
82   "agv_2": "54",  
83   "dea_3": 1,  
84   "dea_0": 1,  
85   "agv_1": "76",  
86   "icd_384": 1,  
87   "vac_7": 1,  
88   "alert_id": "3147bd",  
89   "icc_1": 1,  
90   "dea_9": 1,
```

# Data processing: API



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🔒 [https://madagascar.emro.info/api/aggregate\\_year/age\\_6/1](https://madagascar.emro.info/api/aggregate_year/age_6/1)

JSON Raw Data Headers

Save Copy

▼ weeks:

1:	99
2:	147
3:	203
4:	176
5:	185
6:	196
7:	169
8:	152
9:	167
10:	154
11:	176
12:	154
13:	148
14:	125
15:	173
16:	142
17:	171
18:	92
year:	2829