From Information to Action

WHO Perspectives

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Building on Best Practices

-To Inform Decision-Makers on What to do, Where and When

- To Trigger in a Timely Manner either Local or Multi-country Response as appropriate following agreed upon SOPs

A Few Examples

- Health Metrix Network (HMN)
- Polio Eradication Programme
- Onchocerchiasis Eradication Programme
- *Early Warning and Response Functions Within Public Health surveillance Systems*
- *Malaria Early Warning Systems (MEWS)*
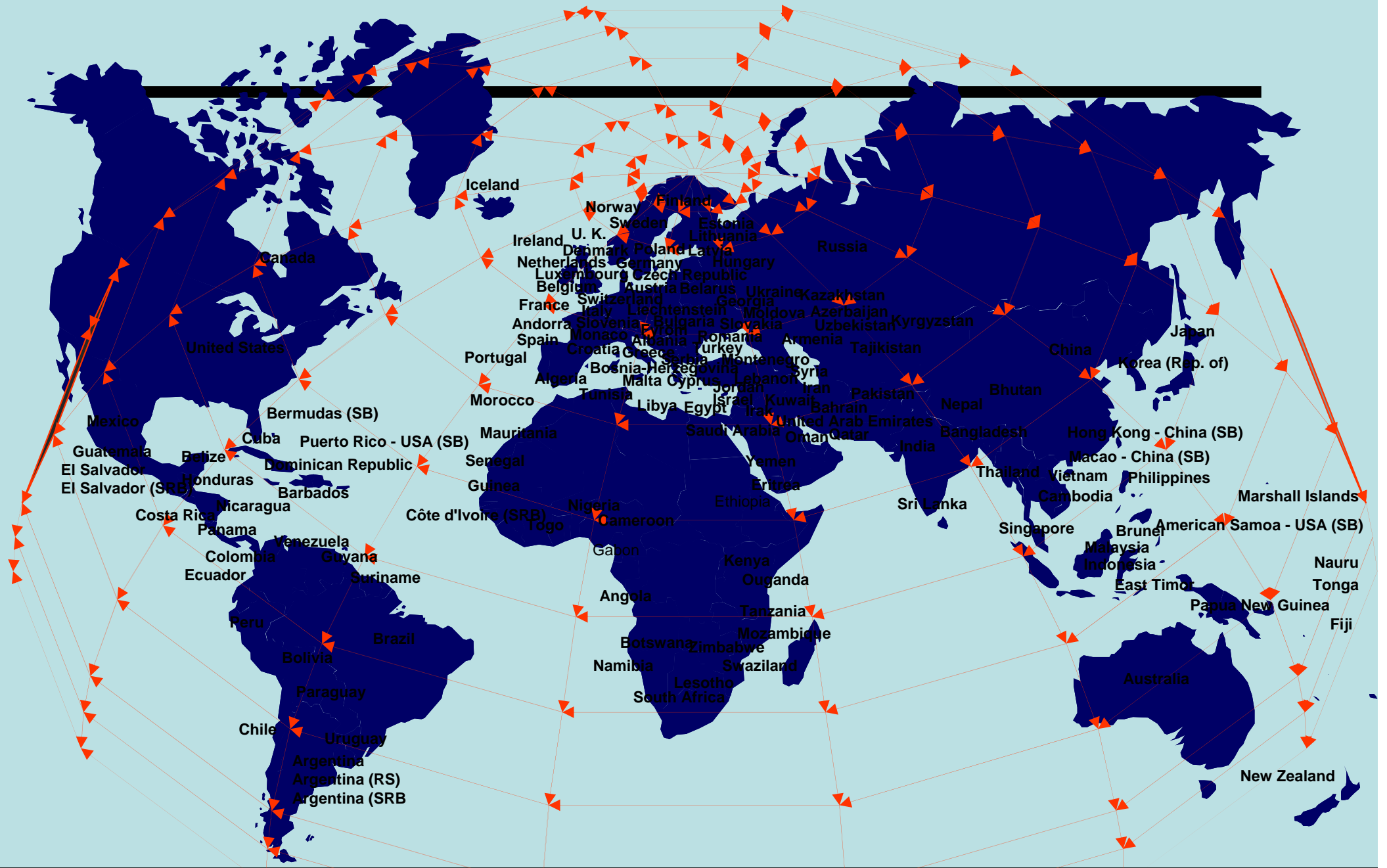- Several multi-country initiatives in the Asia-Pacific region

The Health Metrix Network (HMN)

- First Multi-donor Global Health Partnership
- Secretariat in WHO Geneva
- To Strengthen Health Information and Statistical Systems in Countries
- To Support National Leadership in the Generation of All Relevant Information
- To Underpin Evidence-based Policy Decisions

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Expectations of the HMN

- To become a universally accepted standard for guiding the collection, reporting and use of health information by all countries and global agencies
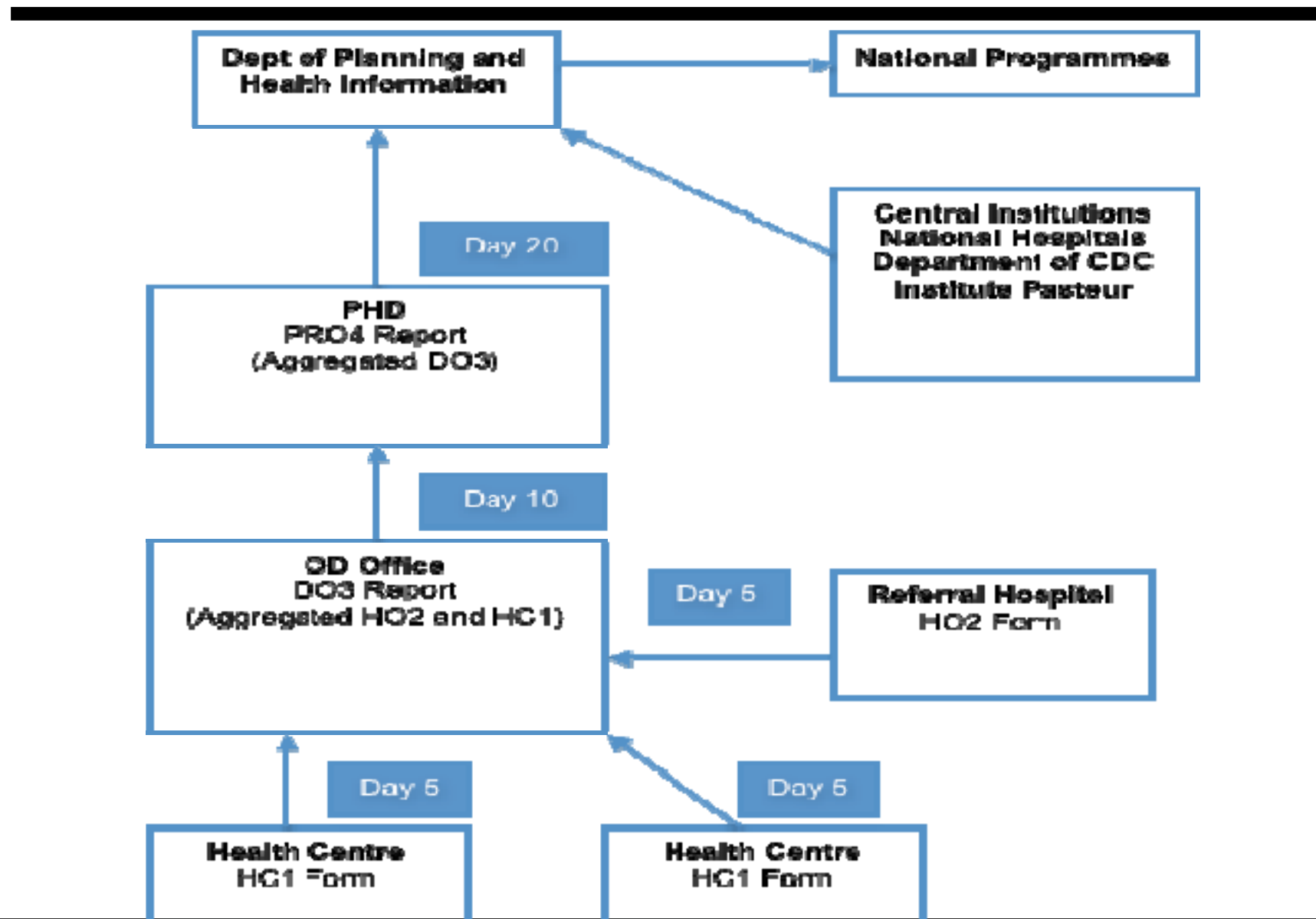- www.healthmetricsnetwork.org

Understanding Each Others Through Networking Protocols
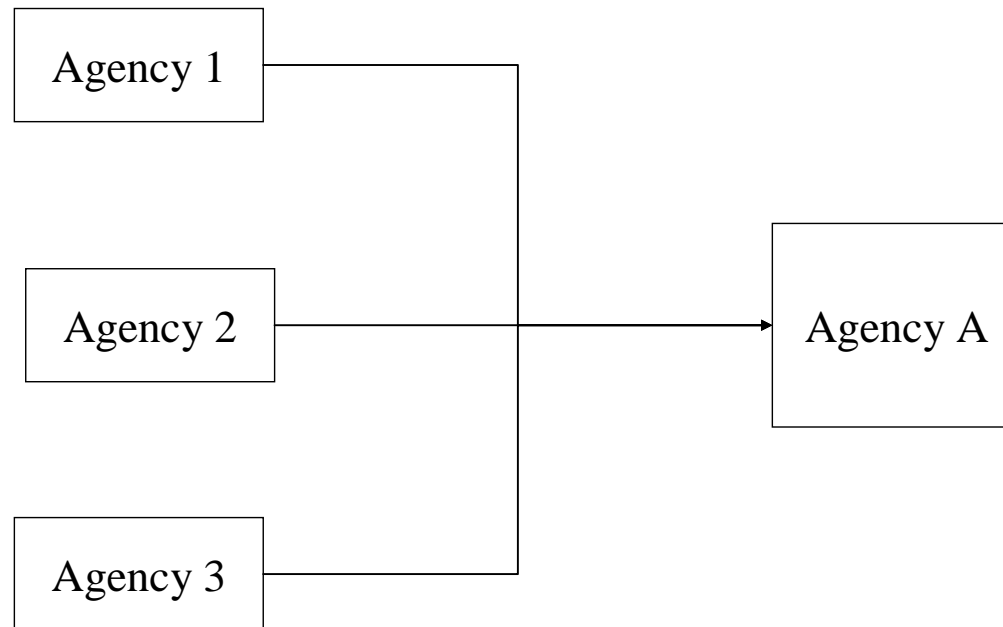
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INFORMATION IS LOCALLY GENERATED …

… And Locally Mapped for Active Investigation

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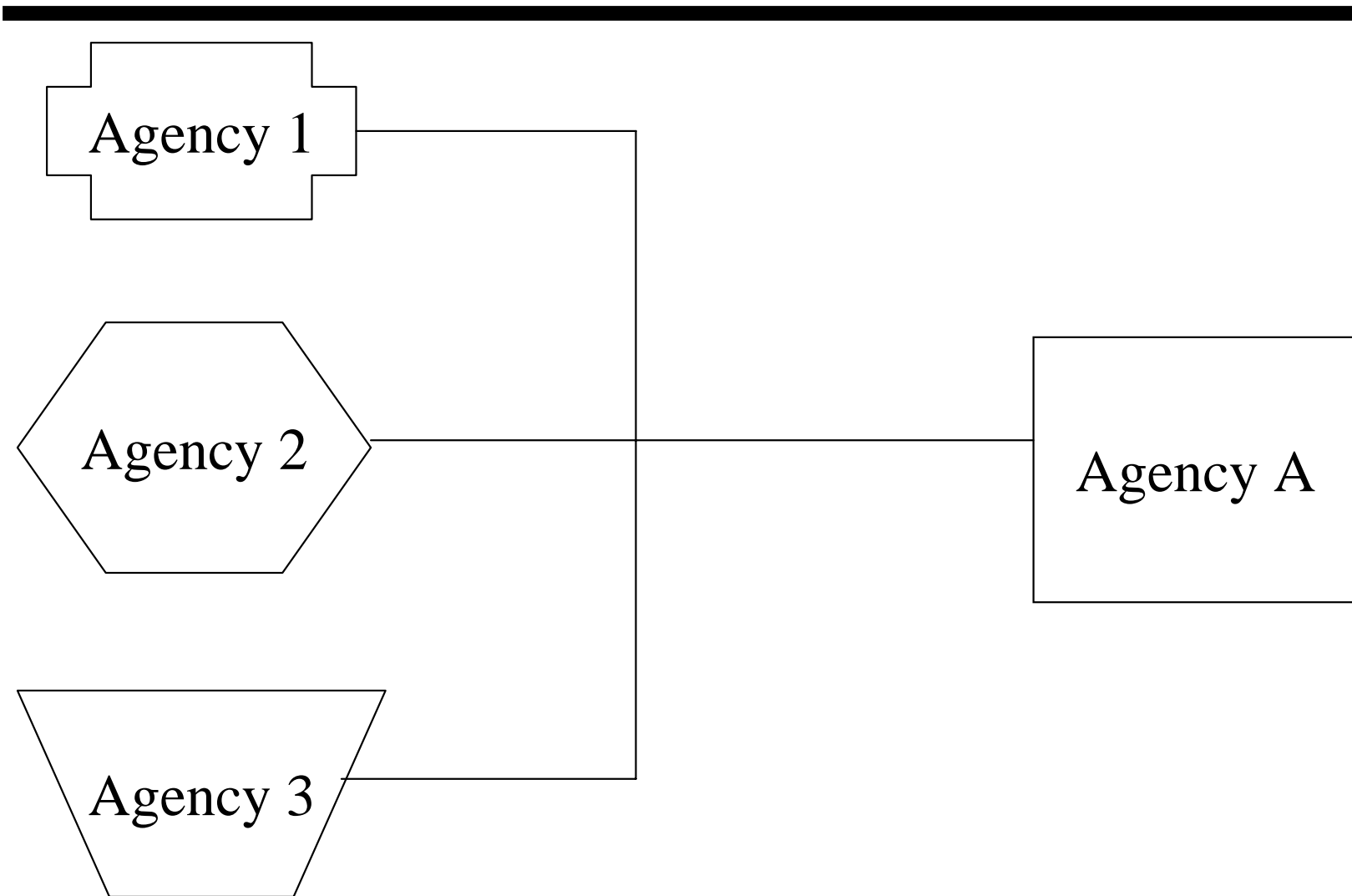Centara Grand & Bangkok Convention Centre at Central World, Bangkok, Thailand

Limited feed-back to those generating data and reporting on papers

Multiple Sources of Data

Agency A imposes software / data structure formats

Agency 1

Agency 2

Agency 3

Agency A

Or Common Structure / Coding conventions simple enough to be produced by a variety of software packages

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Free-forward programme converting data into common DEF

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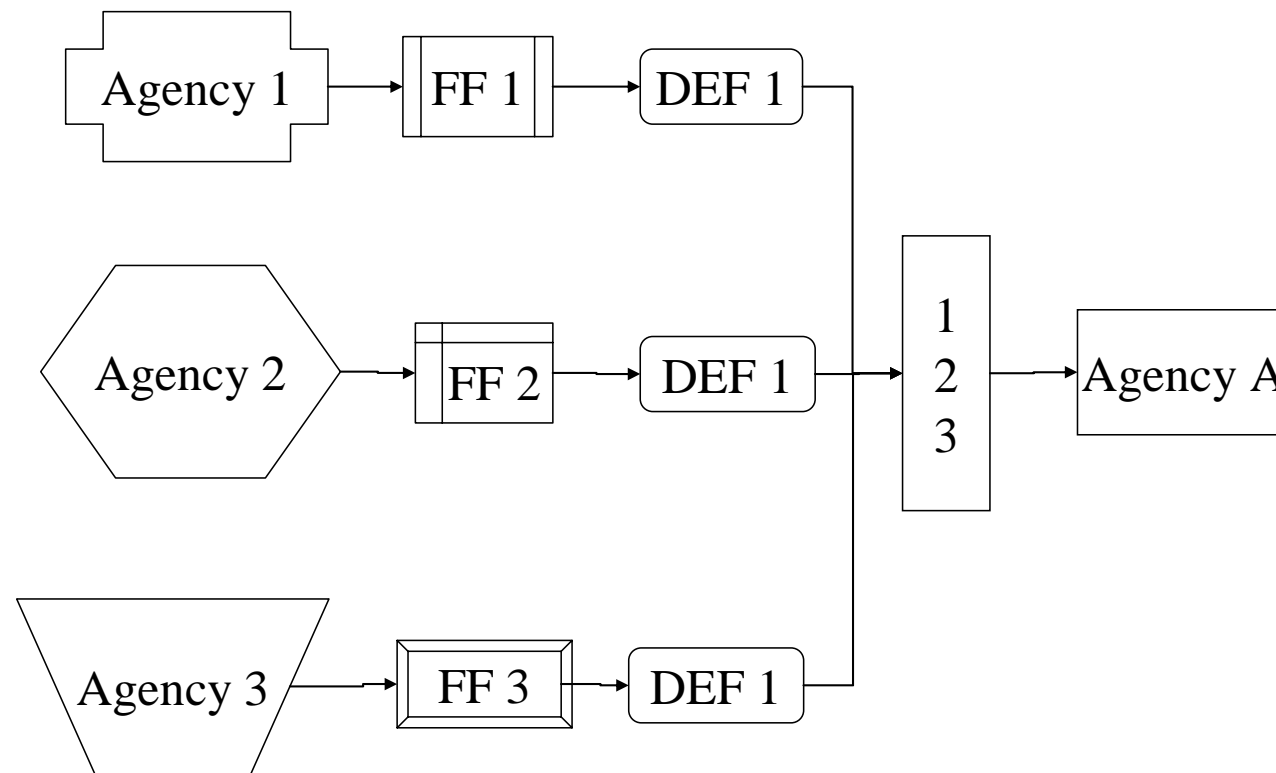
Free-Forward Programme

Performs the following steps:

- Reads the local database,

- Selects only the records eligible under the DEF,

- Defines variables specified in the DEF,

- Assigns values in the DEF based on data in the original file.

- Outputs a file for transmission in the DEF format.

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Polio Eradication Programme

- Successfully using Standard Data Exchange Formats (SDEFs)

- The **Legal Electronic Data Exchange Standard** is a set of file format specifications intended to standardize bill/invoice data transmitted electronically ("e-billed") from a law firm to a corporate client. It is abbreviated **LEDES** and is usually pronounced as "leeds".

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- Electronic Data Interchange (EDI) can be formally defined as *'The transfer of structured data, by agreed message standards, from one computer system to another without human intervention*'

Certification of data leading to correct information

Each partner is responsible for ensuring that the data they extract and transform confirms to case definitions and coding schema. Receiving partners are encouraged to create load routines that perform data validation check.

Data are exchanged primarily as email attachments and participants are responsible for source validation.

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Added value of electronic systems to papers?

Added values

- Increase efficiency and effectiveness
- Easily monitor timeliness and completeness of the system
- Increase quality in data management using pre-defined indicators
- Introduce standard thresholds for each disease able to produce signal to trigger immediate response
- Fully automatic to produce immediate feedback

Timeliness

- Delay / speed between steps in surveillance
  - onset
  - diagnosis
  - report
  - data entry
  - analysis
  - interpretation
  - Intervention

Time

Mostly Human depending

A computer application can influence very much with the support of efficient communication system

Specific needs

- The computer application should be flexible enough to:
  - Easily introduce or take out new health events
  - Introduce or change variables as age and sex
  - Adapt threshold according to sensitivity of the system
  - Easily change language for different users

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Specific needs

- The system should be simple enough to:
  - Have a friendly users interface to reduce as much as possible errors in uploading data
  - Completely automatic in the way to produce standard signals for alerts, indicators, tables, graphics and maps
  - Extract most important data to produce a standard 2 pages weekly/daily bulletin

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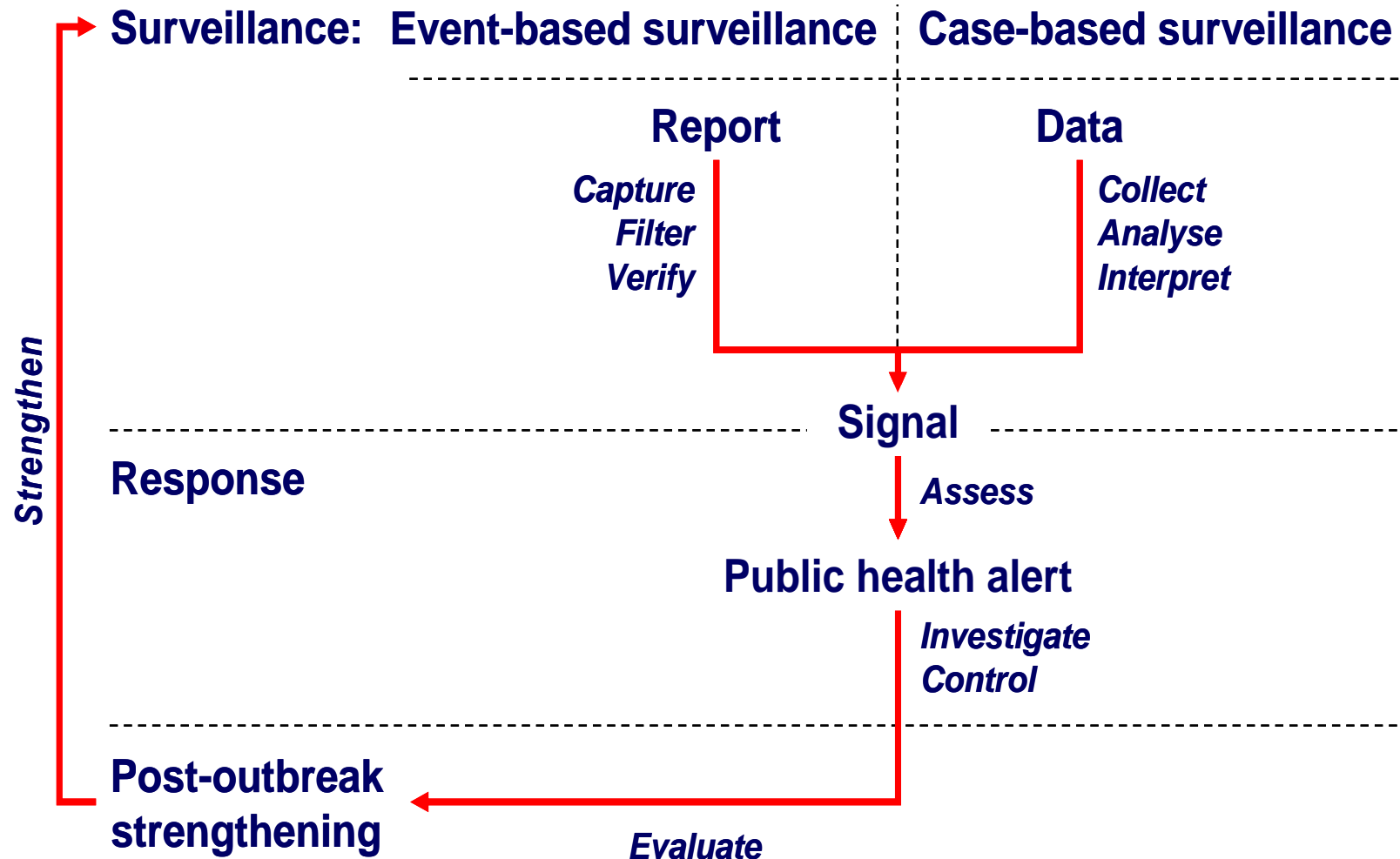# Are data / information generated useful to take local/national action?

- Most data generated are too numerous, coming from different sources / different channels with different definitions, so not seen at all, not properly read and leading to *no action* or *delayed* response

- Those generating data and information don't receive any feed back : in general, arrows are all going to the same direction : bottom up!

Are data / information generated useful to identify and take supranational action as well?

•Are we talking about / referring to the same information even when speaking the same language in the same country?

• Do individuals generating data understand why that information might be useful for collective understanding, health security matters and action?

Early warning and response

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HC/FDH	RH/FDH	OD OFFICE	PHD	CNM

Lab & clinical staff identify D3+ case from malaria register

D3+ investigation form completed; coded SMS to CNM

SMS processed, tables & maps generated

SMS sent to OD, PHD with details of hospital, village, patient name, date

SMS received by OD – for action

SMS received – for information only

Screening strategy agreed

Call to OD to discuss screening; investigative team sent if required

Call received & screening activities agreed

Call to HC to arrange screening

Strategy agreed

Voice call to liaise with PHD & request supervisory support

Voice call to get update on activities at HC level

Screening completed; call to OD to report results & decide on IRS strategy; paper report and samples returned to OD

Verbal report received, IRS strategy agreed & discussed with CNM, PHD; *PCR samples sent to IPC*

Strategy agreed

Strategy agreed

IRS completed; verbal and written reports to OD

OD staff report to PHD & CNM by voice call; paper report to CNM

Reports received

Reports received, logged

PCR results received from IPC; call to HC [or VMW] to arrange treatment of PCR positives

DOT treatment of PCR-positives completed

On discharge, copy of D3+ investigation form sent to OD

D3+ investigation form received; copy sent to CNM

D3+ investigation form received, logged

The components of a computerized EWARN System

- Data collection
  - Data entry
  - Data import from an existing system
- Data analysis
- Generation of signals
- Presentation of results
- Generation of standardized reports

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Reasons for a computerized system

- Standardization of:
- - Data collection
- - Data flow
- - Data exchange
- ➔ Better data quality (filters and quick identification of potential errors)
- ➔ Faster data availability

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Reasons for computerized

- Report generation
- Automated report generation with updated data
- Customized reports
  - Optimized presentation including maps
- ➔ Easier, faster feedback
- Interactive browsing/exploration of data
- Information on demand
- Info linked to interactive maps

Reasons for computerized systems

- Improved and faster analysis
- Larger datasets can be analysed
- Real-time Info
- Use of different algorithms
- Automated signal generation and flagging of situation for immediate attention
- ➔ Rapid but accurate information leads to rapid investigation and response

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Malaria Epidemics

3 steps

- - long range prediction

- - early warning

- - early detection

LONG RANGE FORECASTING BASED ON INDIRECT RISK FACTORS (e.g. ENSO parameters)
Long lead times but low specificity
Warning at the national/regional scale

FLAG 1

Possible indicators: ENSO parameters, medium range weather forecasts
Responses: ensure early warning and detection systems are operational; mobilise resources at the national scale

SST threshold
Measured SST

EARLY WARNING BASED ON MONITORING OF KNOWN RISK FACTORS (e.g. rainfall)
Shorter lead times and improved specificity
Warnings at the district scale

FLAG 2

Probable indicators: meteorological parameters
Responses: ensure surveillance systems are functioning and local response reserves prepared

Rainfall threshold

Measured rainfall
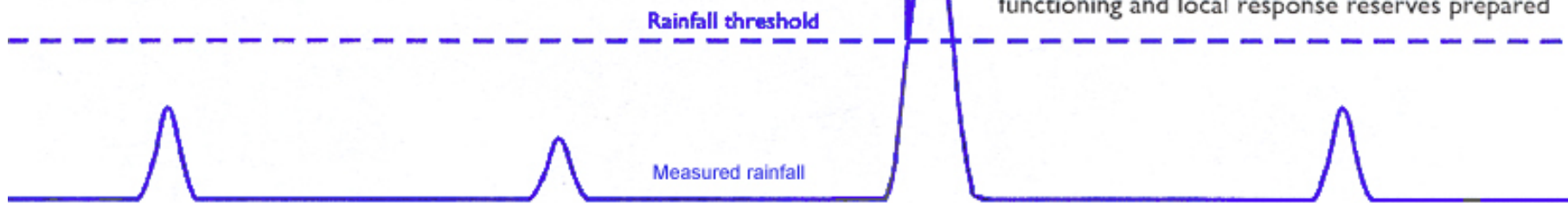
EARLY DETECTION OF EPIDEMICS BASED ON MALARIA CASE DATA
Very short lead times but very high specificity
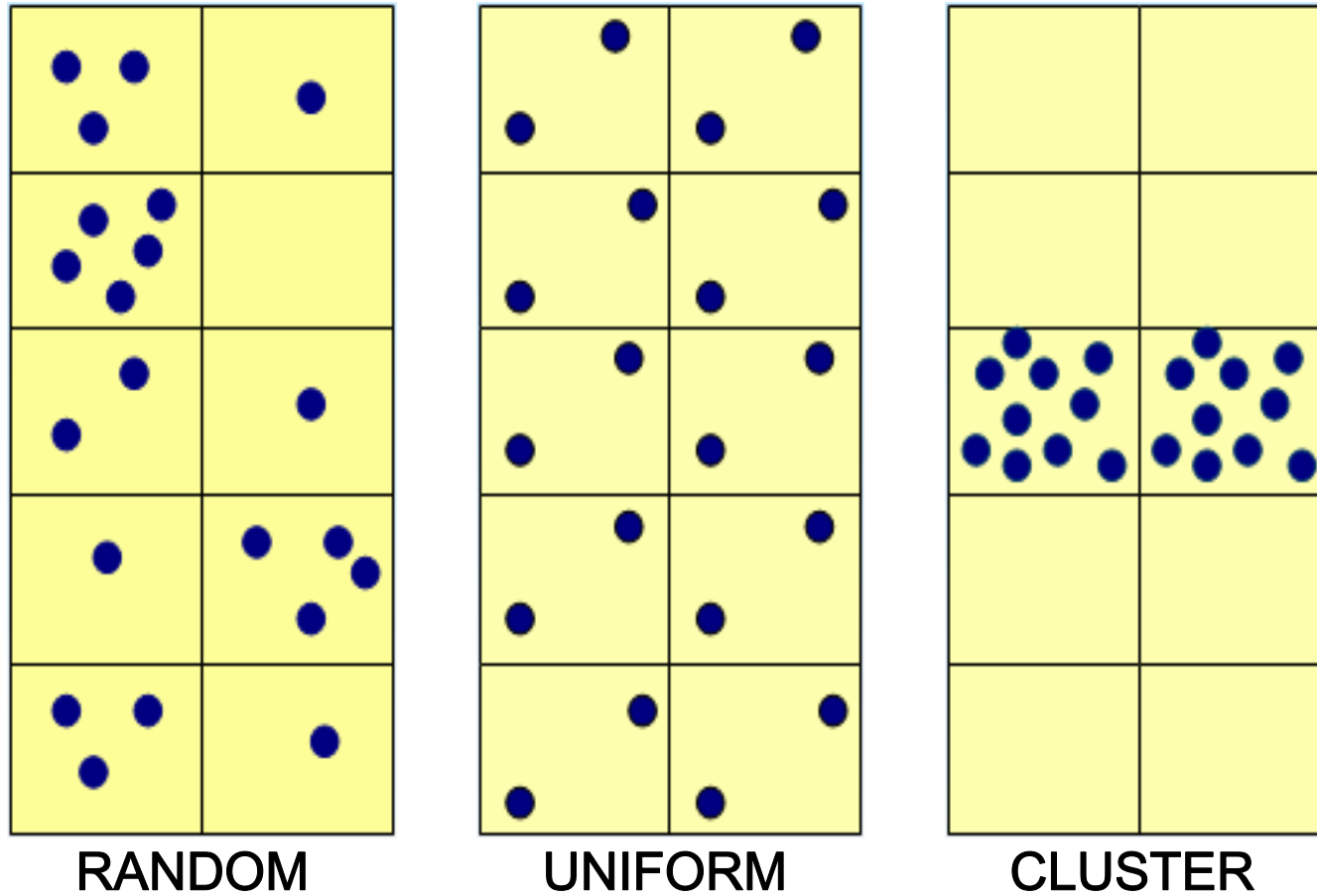Detection at the sub-district scale

FLAG 3

Indicators: facility data
Responses: epidemic control measures

Case threshold

Recorded cases

EPIDEMIC

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Spatial Analysis of any events

- GIS analysis could be performed in three directives:
  - **Elementary analysis** involves the making of maps to allow simple visual inspection of a geographic phenomenon.
  - **Cluster analysis** attempts to identify possible spatial distributional patterns (whether clustered, dispersed or random).
  - **Contextual analysis** aims at explaining relationships between geographic phenomena (whether there is spatial autocorrelation) or temporal variation (where there is a trend).

- In some GIS modeling procedures, prediction can be made with reference to existing trends and distributional patterns.

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Thank you

RANDOM   UNIFORM   CLUSTER

But how to decide?