Use of different data sources for syndromic surveillance in Europe

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Background

- Syndromic surveillance based on clinical signs and symptoms or proxies is being increasingly used in Europe as supplementary information for timely detection and monitoring of communicable and non-communicable public health threats[1]
- No general compilation of good practices is available
- Triple-S Project develops guidelines for implementing syndromic surveillance systems in Europe based on the review of existing activities with one focus on syndromic data sources

Methodology

- **Literature review**
  - PubMed indexed literature
  - 239 abstracts, 97 full texts
  - published: 2002 - June 2012
  - describing syndromic surveillance systems in high-income countries
- **Study visits of syndromic surveillance systems in Europe**
  - 9 countries + European project SIDARTHa[2]
  - June 2011 - June 2012
  - existing, planned, pilot or expired
- Strengths-Weaknesses-Opportunities-Threats (SWOT) assessment of utility based on CDC criteria for evaluating early outbreak detection systems[3]

Results: Syndromic Data Sources Utilisation

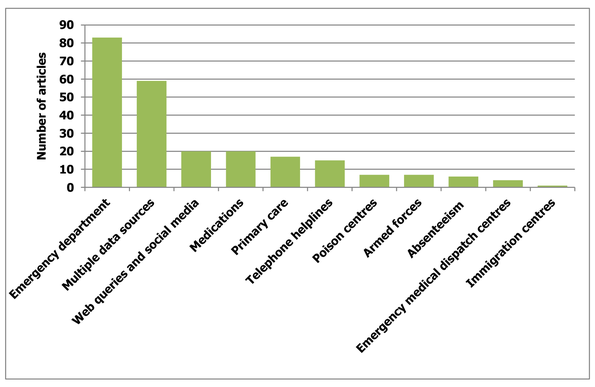

Figure 1: Number of articles included in review by syndromic data source

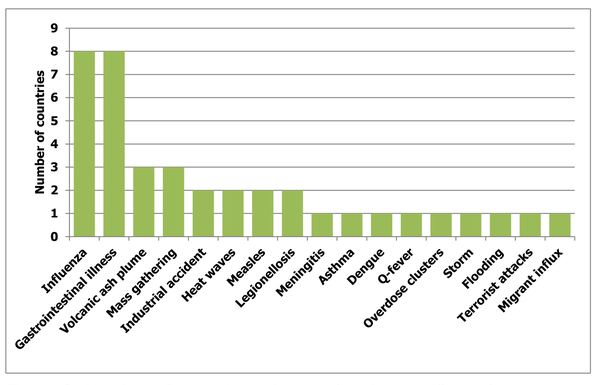

Figure 2: Number of countries using syndromic surveillance by purpose (as reported during study visits, multiple counts possible)

Table 1: Syndromic data sources used in visited countries (regional/national level)

Visit No.	Visited countries	Data Source: Emergency Department	Primary Care	Emergency Medical Dispatch	Ambulance Service	Telephone helpline	Laboratory requests	Child day care centre	Immigration	Armed forces	Web queries	TOTAL
1	Netherlands	2	2	1			1	1				**7**
2	SIDARTHa*	3		1	3							**7**
3	England	1	3			1						**5**
4	Italy	3							1			**4**
5	Scotland		2			1						**3**
6	France	1	1							1		**3**
7	Sweden					1					1	**2**
8	Denmark		1	1								**2**
9	Hungary	1		1								**2**
10	Belgium	1		1								**2**
TOTAL		**12**	**9**	**5**	**3**	**3**	**1**	**1**	**1**	**1**	**1**	**37**

* The European project SIDARTHa comprised at the time of the visit regions in the following countries: active: Austria, Spain; pilot: Belgium, Germany; planned: Denmark (described for this analysis were results from all countries except Denmark)

Literature review

- Variety of data sources (fig. 1)
- Emergency department is established as data source (fig. 1)
- Trend towards multiple data source systems (fig. 1)
- Web queries as data source is a new trend (majority are recent publications)
- Publications on primary care are increasing, publications on medications and telephone helplines are decreasing

Study visits

- Variety of purposes, main use for influenza like and gastrointestinal illness (fig. 2)
- Majority are regional, few national activities
- Varienty of data sources (table 1) and of composition of same data source between countries
- Activities often start with one data source, one health problem
- Purpose changed more towards reassurance during unexpected (also non-communicable disease) events instead of early warning of communicable disease outbreaks

Results: Syndromic Data Sources SWOT

Data sources complement each other

Data sources cover different stages in the course of illness; some are timelier than others, they cover different populations, they offer complementary advantages and disadvantages

- **Example 1:** Web queries are influenced by external factors (e.g., media reports) and do not necessarily represent illness cases contrary to emergency dispatch data but there is evidence that web queries provide timelier information on disease outbreaks (fig. 3)
- **Example 2:** Data on web queries is available free-of-charge, in real-time and at any time (fig. 3) while telephone helplines exist only in few countries
- **Example 3:** While there is no small-scale geographic information available for web queries, emergency dispatch data provide the exact address of the emergency (fig. 3)

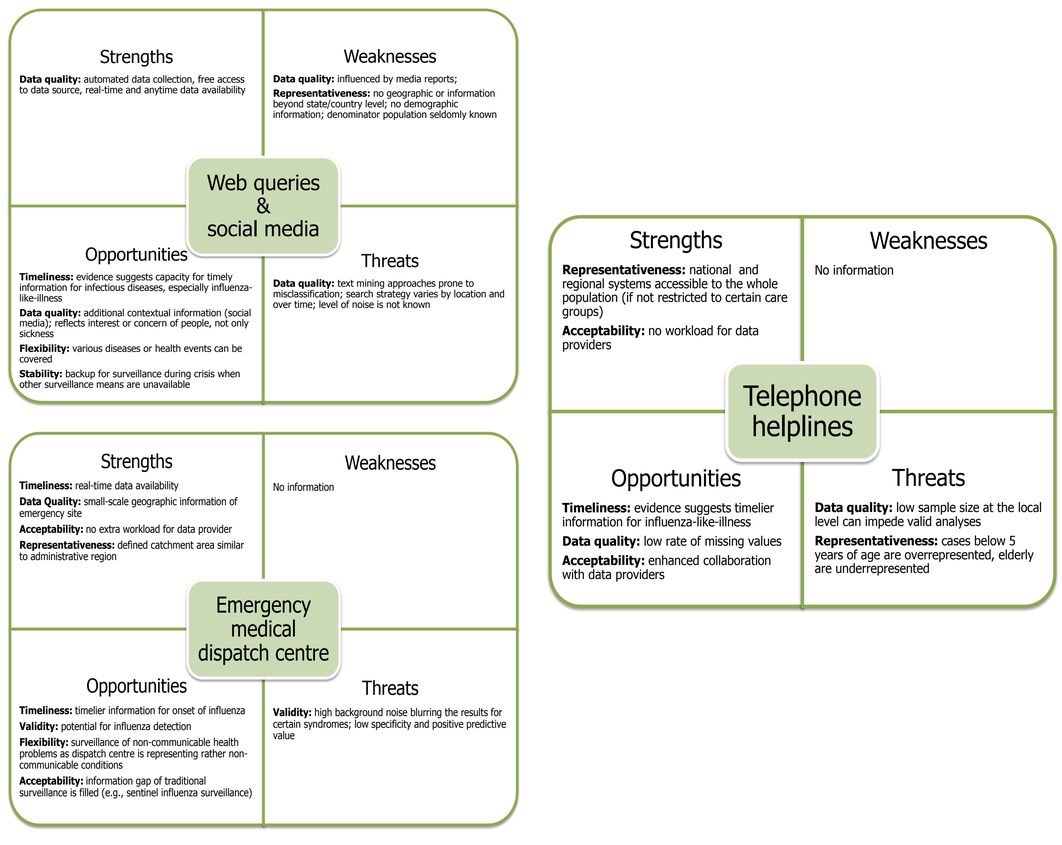

Figure 3: SWOT analysis of three selected syndromic data sources (based on results from literature review and study visits)

Conclusions for Syndromic Surveillance in Europe

- **High flexibility: No single best data source and no single utility**
- **High variety: Comparative surveillance based on results, not data**
- **Think big: Complementarity by multi-source syndromic surveillance systems**
- **Start small: At regional level, with one data source, and one health problem**

References

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3. Centers for Disease Control and Prevention (CDC) (ed.). Framework for evaluating public health surveillance systems for early detection of outbreaks. Recommendations from the CDC Working Group. In: Morbidity and Mortality Weekly Report 2004;53(RR05):1-11.

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