

Review of evaluation processes of Web-based systems mining medical information applied to epidemic intelligence.

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ABSTRACT

Introduction: Global public health threat detection is well known to integrate event-based surveillance process, using media sources. Systems able to mine unstructured data from internet-based media including social network emerged during the past 15 years. To measure their specific performance, several evaluations have been conducted in different perspectives, without standard of methodology, in opposition to the indicators-based surveillance.

Material and methods: The survey aimed at identifying, by a literature review, the different processes and relevant indicators used in the evaluation of main event-based systems (GPHIN, ARGUS, ProMed, PULS, MedISys, HealthMap, BioCaster, EpiSpider).

Results: We identified 24 relevant studies. Evaluations were tailored according to the system: automatically or human moderation. Most of the studies (67%) were aimed at measuring the system performance in terms of text classification and geo-encoding; main indicators were quantitative: accuracy, precision, recall and F-measure. These evaluations concerned automatically systems. The users' perspective was considered in 33% of the studies with the following indicators: utility, timeliness and sensitivity.

Conclusions: Although the epidemic intelligence community now commonly uses Web-based systems, efforts towards a harmonized evaluation framework remain to be undertaken. One crucial challenge is considering user's perspective in evaluations and not focusing only on system's perspective.