[redacted]

The TIDieST (Template for Intervention Description for Systems for Triage) Checklist:*

Information to include when describing an intervention for online self-triage systems

Item number	Item
	BRIEF NAME
1.	**Provide the proprietary name or generic name that describes the intervention.**
	babylon check
	WHY
2.	**Describe the objective of the intervention (*not the study*).**
	To provide an automated service allowing patients to check symptoms and receive fast and clear advice on what action to take.
	WHAT
3.	**Interface: Describe the physical characteristics of the interface, including layout, design and any adaptations for accessibility etcetera. Provide information on where the interface can be viewed (e.g. online, screenshots, demo, URL, research article figures).**
	The babylon check system is described as an 'app with a chat bot-style interface'.[6] At the time of writing (May 2018), little information on the symptom checker was available on the website of the supplier, Babylon Health (www.babylonhealth.com, accessed 11 May 2018). An app that could be downloaded appeared to relate to the company's 'GP at hand' service for GP appointments.
4.	**Procedures: Describe each of the procedures, activities, and/or processes used in the intervention, including any enabling or support activities.**
	The symptom checker involves the user selecting a body part and answering a series of multiple choice questions. The system collects possible outcomes based on the answers given and whether the triggers doe these outcomes are satisfied. Possible outcomes (recommendations) are discarded if particular features (exemptions) are present. This process leads to a list of possible outcomes, of which the highest priority one is presented to the user.[26]
	HOW

6.	**Describe how the system is accessed e.g. via Web pages, a remote computer, an app etcetera.** The system is accessed via a smartphone app.
	TAILORING
9.	**Describe provision for particular disease groups or populations and how these differ from general provision.** Not reported.
	MODIFICATIONS/VERSIONS
10.	**If the intervention was modified during the course of the study, describe the changes (what, why, when, and how).** Not reported.
	HOW WELL
11.	**Simulation/Laboratory Testing: How the intervention was tested and by whom.** The system was tested by the manufacturer in two stages.[26] The initial validation used 33 clinical scenarios validated by external experts to test babylon check. The system performed significantly better than the average performance of automated triage systems reported in the literature, particularly for non-emergency care and self-care. A further test compared babylon check's performance with that of doctors and nurses using 102 patient vignettes.[26]
12.‡	**Real world testing: How the intervention was tested and by whom.** Babylon check was one of four systems evaluated in ongoing NHS England pilot studies. Preliminary results have been reported.[6]

The TIDieST (Template for Intervention Description for Systems for Triage) Checklist:*

Information to include when describing an intervention for online self-triage systems

Item number	Item
	BRIEF NAME
1.	**Provide the proprietary name or generic name that describes the intervention.**
	Internet Doctor
	WHY
2.	**Describe the objective of the intervention (*not the study*).**
	To provide tailored advice on self-management of minor respiratory symptoms.
	WHAT
3.	**Interface: Describe the physical characteristics of the interface, including layout, design and any adaptations for accessibility etcetera. Provide information on where the interface can be viewed (e.g. online, screenshots, demo, URL, research article figures).**
	A screenshot of the interface is provided in the paper by Yardley et al.[24] The home page explains what the site offers and provides links to details of the medical expert on the team and the medical evidence supporting the advice offered. From the home page, participants could choose to access diagnostic pages, treatment pages or common questions. Further details are provided in a multimedia appendix to the paper.
4.	**Procedures: Describe each of the procedures, activities, and/or processes used in the intervention, including any enabling or support activities.**
	The intervention was created by the research team using LifeGuide software. Advice was based on evidence-based resources and the clinical expertise of members of the research team. The content of the information provided was informed by psychological theory, including Bandura's Social Cognitive Theory and Leventhal's model of self-regulation of illness. The diagnostic pages asked a series of questions about the participant's symptoms. These were completed for one symptom at a time and the algorithm provided advice on whether they should contact health services for that symptom. The treatment pages provided information about natural remedies or over-the-counter medication and advice on how to boost the immune system.
	HOW

6. **Describe how the system is accessed e.g. via Web pages, a remote computer, an app etcetera.**

Via web pages (www.internetdr.org.uk).

TAILORING

9. **Describe provision for particular disease groups or populations and how these differ from general provision.**

Not reported.

MODIFICATIONS/VERSIONS

10. **If the intervention was modified during the course of the study, describe the changes (what, why, when, and how).**

Not reported.

HOW WELL

11. **Simulation/Laboratory Testing: How the intervention was tested and by whom.**

Reports of simulation testing were not available.

12. **Real world testing: How the intervention was tested and by whom.**

The intervention was tested in a preliminary RCT primarily involving university students to assess usage and effects on patient enablement and use of health services.[24] A larger RCT in a UK primary care population evaluated effects on health service contacts for those reporting respiratory infections during the study period, as well as hospitalisations and symptom duration and severity.[16]

The TIDieST (Template for Intervention Description for Systems for Triage) Checklist:*

Information to include when describing an intervention for online self-triage systems

Item number	Item
	BRIEF NAME
1.	**Provide the proprietary name or generic name that describes the intervention.**
	Influenza self-triage module (ISTM)
	WHY
2.	**Describe the objective of the intervention (*not the study*).**
	To enhance patient self-management of seasonal influenza and facilitate patient–provider communication.
	WHAT
3.	**Interface: Describe the physical characteristics of the interface, including layout, design and any adaptations for accessibility etcetera. Provide information on where the interface can be viewed (e.g. online, screenshots, demo, URL, research article figures).**
	The system appears to be no longer available. A search of the producer's website (www.okprn.org) revealed no further information.
4.	**Procedures: Describe each of the procedures, activities, and/or processes used in the intervention, including any enabling or support activities.**
	The self-triage module was developed by a practice-based research network (PBRN) multidisciplinary stakeholder group with input from national experts and clinicians in several PBRNs. Several draft versions were developed and piloted. The module was provided to primary care practices as part of an influenza management website which was tailored to the needs of each participating practice.
	HOW
6.	**Describe how the system is accessed e.g. via Web pages, a remote computer, an app etcetera.**
	The system was accessed via the websites of participating practices.
	TAILORING
9.	**Describe provision for particular disease groups or populations and how these differ from general provision.**

English and Spanish language versions were available.

MODIFICATIONS/VERSIONS

10. **If the intervention was modified during the course of the study, describe the changes (what, why, when, and how).**

Additional questions were added to improve patient safety (e.g. a question about rash to detect possible meningococcal disease). The official influenza-like illness criteria of the Centers for Disease Control and Prevention were expanded to include additional symptoms such as sore throat, nasal congestion, aching muscles and a runny nose. Additional refinements (details not reported) reduced the time for completion of the protocol (via telephone) to about three minutes.

HOW WELL

11. **Simulation/Laboratory Testing: How the intervention was tested and by whom.**

Not reported.

12.‡ **Real world testing: How the intervention was tested and by whom.**

The system was tested in 12 primary care practices during the peak of the 2007–2008 influenza season.[19]

The TIDieST (Template for Intervention Description for Systems for Triage) Checklist:*

Information to include when describing an intervention for online self-triage systems

Item number	Item
	BRIEF NAME
1.	**Provide the proprietary name or generic name that describes the intervention.** Un-named prototype adapted from a widely used telephone triage system that supports nurses' decision-making in primary care.[21]
	WHY
2.	**Describe the objective of the intervention (*not the study*).** To enable patients to undertake a self-assessment triage and receive advice on an appropriate course of action based on their symptoms.
	WHAT
3.	**Interface: Describe the physical characteristics of the interface, including layout, design and any adaptations for accessibility etcetera. Provide information on where the interface can be viewed (e.g. online, screenshots, demo, URL, research article figures).** The system had a simple user interface and menu from which patients could select their main presenting symptom from a list of several hundred presenting complaints.
4.	**Procedures: Describe each of the procedures, activities, and/or processes used in the intervention, including any enabling or support activities.** Based on the main complaint, the system generated age- and gender-specific questions with associated potential answers. Each answer carried a weighting which contributed to the final triage outcome. Some answers were linked to further question sets, allowing multiple symptoms to be evaluated. The system had question sets covering the full range of primary care presentations. The triage advice provided by the system consisted of one of six courses of action: call 999; seek GP care immediately; seek care within six hours; seek care within 24 hours; seek a routine appointment; and self-care. The system also created a self-assessment record which summarised the history of the presenting condition.
	HOW

6.	**Describe how the system is accessed e.g. via Web pages, a remote computer, an app etcetera.** In the study evaluating the system, access was via a desktop computer.[21]
	TAILORING
9.	**Describe provision for particular disease groups or populations and how these differ from general provision.** Not reported.
	MODIFICATIONS/VERSIONS
10.	**If the intervention was modified during the course of the study, describe the changes (what, why, when, and how).** Not reported.
	HOW WELL
11.	**Simulation/Laboratory Testing: How the intervention was tested and by whom.** Not reported.
12.‡	**Real world testing: How the intervention was tested and by whom.** The system was tested in a university student health centre by Poote et al.[21] Students used the system before a face-to-face consultation with a GP. The system rating of urgency of the student's condition was compared with that of the GP (who had access to the output from the automated system).

[redacted]

The TIDieST (Template for Intervention Description for Systems for Triage) Checklist:*

Information to include when describing an intervention for online self-triage systems

Item number	Item
	BRIEF NAME
1.	**Provide the proprietary name or generic name that describes the intervention.**
	Strategy for Off-Site Rapid Triage (SORT)[15]
	WHY
2.	**Describe the objective of the intervention (*not the study*).**
	To create a simple but accurate tool that could help minimally trained health care workers screen large numbers of patients with influenza-like illness.
	WHAT
3.	**Interface: Describe the physical characteristics of the interface, including layout, design and any adaptations for accessibility etcetera. Provide information on where the interface can be viewed (e.g. online, screenshots, demo, URL, research article figures).**
	See online Figures E1-E3. SORT versions 1.0-3.0. No screenshots. 2 interactive Web sites, http://www.Flu.gov and http://www.H1N1ResponseCenter.com
4.	**Procedures: Describe each of the procedures, activities, and/or processes used in the intervention, including any enabling or support activities.**
	The group then developed an efficient, 3-step process to assess patients with influenza-like illness. In the first step, patients are screened to determine whether they meet CDC criteria for influenza-like illness. Those who do proceed to the second step, an assessment of illness severity (using questions adopted from the CRB-65 score). Patients with influenza-like illness who have a CRB-65 score of 0 (suggesting relatively mild illness) move on to the third step, a short series of questions designed to determine whether they have a health condition that increases their risk of developing severe complications of influenza.

According to the patient's answers, SORT assigns a level of risk and recommends a specific action. Patients with "**high-risk" influenza-like illness**—in the group's first iteration of the algorithm**, those with a CRB-65 score of 3 or more—would be sent directly to an ED.** "Intermediate-risk" patients—**CRB score of 1 or 2 or comorbid conditions that increase their risk of complications—would be advised to contact their physician or seek care in a walk-in clinic** because early administration of antiviral medication might reduce the chance of complications. **"Low-risk" patients—those with mild disease (CRB-65=0) and no comorbid conditions—would be advised to convalesce at home.**

Support activities involved drafting health literacy friendly instructions and involvement of professional associations.

HOW

6. **Describe how the system is accessed e.g. via Web pages, a remote computer, an app etcetera.**

On October 2, 2009, the CDC adopted a slightly modified version of SORT 3.0 and posted it on the agency's Web site at http://cdc.gov/h1n1flu/clinicians/pdf/adultalgorithm.pdf. In an accompanying disclaimer, the CDC stated that the algorithm was intended for use "by physicians and those working under their supervision." It was also limited to patients older than 18 years.

Five days later, US Department of Health and Human Services (HHS) secretary Katherine Sibelius announced the **posting of an H1N1 self-evaluation application** at http://www.Flu.gov. It closely adheres to the CDC's adult algorithm and used many of the terms and phrases we devised for our demonstration Web site. It is intended for use by adults older than 18 years.

The same day (October 7, 2009), **Microsoft Corporation unveiled its own flu self-assessment application** at http://www.H1N1ResponseCenter.com. Like Flu.gov's application, Microsoft's site closely adheres to the CDC's adult algorithm and uses health-literate language licensed, at no charge, from Emory University. Both HHS and Microsoft encouraged health departments, nongovernmental organizations, private health plans, employers, and other organizations to link to their Web sites free. Many chose to do so.

TAILORING

9. Describe provision for particular disease groups or populations and how these differ from general provision.

Although SORT is designed to assess patients with influenza-like illness, the 3-step approach it uses (screening, severity assessment, associated risk factors) may be used to evaluate many illnesses. SORT-like algorithms for selected public health threats such as severe acute respiratory syndrome could be even be prepared and evaluated in advance and deployed if needed. This method could help reassure a nervous public, particularly in the early phases of an outbreak when many people otherwise rush to the nearest ED.

With additional refinement, Web-based decision-support tools such as SORT may be used to collect important epidemiologic information about disease incidence and severity in non-hospitalized individuals. Information of this type is vital to quickly characterize a new disease's attack rate and virulence.

SORT was subsequently modified for use by caregivers of children with ILI as described by Anhang Price et al.[22]

MODIFICATIONS/VERSIONS

10.‡ If the intervention was modified during the course of the study, describe the changes (what, why, when, and how).

SORT was initially envisioned for use by minimally trained health care workers at off-site flu assessment stations and walk in clinics. But the development group quickly realized that a slightly modified version— one that substitutes symptoms for measured respiratory rate and blood pressure— could be used by call centers or even self-administered through an interactive Web site. Ultimately, both versions were included in the group's work product.

HOW WELL

11. Simulation/Laboratory Testing: How the intervention was tested and by whom.

The Kaiser Permanente Colorado Institute for Health Research performed a retrospective assessment, using their health system's computerized records, to determine how well SORT 3.0 would have performed had it been used to screen patients with influenza-like illness. Between April 1 and June 30, 2009, 2,758 outpatients with influenza like illness visited the Kaiser Permanente Colorado health system. SORT 3.0 categorized 1,540 of these encounters (56%) as low risk. During the next 2 weeks, 7 low-risk patients were hospitalized, but only 2 had problems that were related to the index visit (negative predictive value

99.9%). Intermediate-risk patients were much more likely to be admitted within 2 weeks than low-risk patients (odds ratio 11.9; 95% confidence interval 5.29 to 26.9) (D. Magid, personal communication, August 23, 2009).

Buoyed by these findings, they developed a demonstration Web site with branching logic to depict how patients could use SORT to self-assess their need for care. To ensure that the site was comprehensible to laypeople, they asked experts in health literacy at our institution to translate SORT's clinical terms into plain language.[43] More than 100 lay volunteers of widely varying age, race, and socioeconomic status reviewed draft text and offered suggestions on how to make the content understandable and actionable. Some had an influenza-like illness when they participated; others had recently recovered from the flu.

On September 3 to 4, 2009, they presented draft adult and pediatric SORT algorithms and demonstration Web site at a hastily convened Institute of Medicine workshop titled "Assessing the Severity of Influenza-Like Illnesses: Clinical Algorithms to Inform and Empower Health Care Professionals and the Public."[44] The event, which was sponsored by UnitedHealth Group, attracted national leaders from academia, major clinical societies, public health, law, government, and private industry. Feedback was highly favorable.

As soon as the pediatric algorithm was posted, they began drafting health-literate content to offer the guidance directly to the public through the Web. Unfortunately, **the American Academy of Pediatrics opposed this effort because the algorithm was not prospectively validated. Concerns were also expressed that an interactive pediatric Web site might discourage some parents from contacting their child's medical provider.**

Notwithstanding this disappointment, the overall effort to create, test, and deploy SORT was highly collaborative from beginning to end. Numerous organizations and individuals gave freely of their time and expertise. Recognizing the urgency of the effort, Emory's Office of Technology Transfer readily licensed the technology, at no charge, to any vendor who agreed to provide it free.

12.‡ Real world testing: How the intervention was tested and by whom.

Between October 7, 2009, and February 24, 2010, Flu.gov recorded 721,906 total page views, 320,333 visits to Flu.gov/evaluation (the opening page of the self-evaluation site), and 230,761 completed evaluations to flu.gov/evaluation/index2.html (A. Roszak, personal communication). **To reassure the public that the federal government would respect each user's privacy, HHS did not retain data on site visitors.** As a consequence, we have no additional information. Between October 5 and December 13, 2009, Microsoft's Web site, http://www.H1N1ResponseCenter.com , was visited 1.6 million times. Of the 442,000 visitors (28%) who completed a self-assessment, slightly less than half (N=202,000) chose to share anonymous data with the site. Preliminary analysis indicates that 37% of these visitors provided answers that categorized them as high risk and 13% were **too young to receive guidance**. The other half either did not meet influenza like illness criteria or were assessed as not requiring ED treatment. Microsoft did not identify visitors who used the site multiple times, so **it is possible that some individuals repeatedly entered positive replies.** The Web sites were used approximately 650,000 times. We have no way to determine how many times the CDC's adult and pediatric algorithms were **used by clinicians and call centers**. No adverse events were reported. Microsoft's data suggests that their Web site may have prevented as many as 100,000 ED visits, although the true total is probably less. Because HHS did not record data on visitors to Flu.gov, **we cannot estimate the effect of their self-assessment tool.**

Further Literature

Price RA, Fagbuyi D, Harris R, Hanfling D, Place F, Taylor TB, Kellermann AL. Feasibility of web-based self-triage by parents of children with influenza-like illness: a cautionary tale. JAMA pediatrics. 2013 Feb 1;167(2):112-8. [SORT for Kids]

Abdullah N, Annamalai M, RANI A, AMRY MK. Paging Vs. Scrolling: Navigation Styles For Self-Triage Of Epidemic Diseases. *Journal of Theoretical & Applied Information Technology*. 2016 Jun 20;88(2).

D'Angelo MC, Humphreys KR, Li T, Young ME. The Impact of Medical Terminology in Self-Triage Decision-Making. *Frontiers in Communication.* 2017 Jul 26;2:6.

[redacted]

The TIDieST (Template for Intervention Description for Systems for Triage) Checklist:*

Information to include when describing an intervention for online self-triage systems

Item number	Item
	BRIEF NAME
1.	**Provide the proprietary name or generic name that describes the intervention.**
	WebGP, subsequently renamed eConsult
	WHY
2.	**Describe the objective of the intervention (*not the study*).**
	To provide an electronic GP consultation and self-help service for primary care patients.
	WHAT
3.	**Interface: Describe the physical characteristics of the interface, including layout, design and any adaptations for accessibility etcetera. Provide information on where the interface can be viewed (e.g. online, screenshots, demo, URL, research article figures).**
	The home page (as illustrated in the service developer's pilot report)[33] includes links to self-help guides and videos and photographs of practice staff (intended to boost patient confidence). The symptom checker provides lists of common symptoms in alphabetical order and has a facility to choose from 100 common conditions. Full details of the service are available at https://econsult.net/ (accessed 21 May 2018). Adaptations for accessibility not reported.
4.	**Procedures: Describe each of the procedures, activities, and/or processes used in the intervention, including any enabling or support activities.**
	WebGP consists of five services: symptom checker; self-help guidance; signposting to other services; information about the 111 telephone service; and e-consult, allowing the patient to complete an online form which is e-mailed to the practice. GPs use the information provided to arrange a prescription, arrange a face-to-face appointment (via practice admin team) or undertake a phone consultation.
	Details of how the system is integrated into practice procedures are reported to vary between practices.
	HOW

6.	**Describe how the system is accessed e.g. via Web pages, a remote computer, an app etcetera.** The system is accessed through practice websites. **TAILORING**
9.	**Describe provision for particular disease groups or populations and how these differ from general provision.** Not reported. **MODIFICATIONS/VERSIONS**
10.	**If the intervention was modified during the course of the study, describe the changes (what, why, when, and how).** Not reported. **HOW WELL**
11.	**Simulation/Laboratory Testing: How the intervention was tested and by whom.** Not reported.
12.‡	**Real world testing: How the intervention was tested and by whom.** A 6-month pilot report was produced by the Hurley Group, which was involved in developing the system.[33] Subsequent evaluations have been reported in the UK, including in six practices in Devon;[30] and 11 practices across Scotland.[31] A further evaluation was excluded from the main review because of lack of information about the symptom checker aspect of the intervention.[45]

[redacted]

The TIDieST (Template for Intervention Description for Systems for Triage) Checklist:*

Information to include when describing an intervention for online self-triage systems

Item number	Item
	BRIEF NAME
1.	**Provide the proprietary name or generic name that describes the intervention.**
	24/7 WebMed
	WHY
2.	**Describe the objective of the intervention (*not the study*).**
	To enhance services offered by a Student Health Service (SHS) by providing a decision tool to help students decide whether to seek care.
	WHAT
3.	**Interface: Describe the physical characteristics of the interface, including layout, design and any adaptations for accessibility etcetera. Provide information on where the interface can be viewed (e.g. online, screenshots, demo, URL, research article figures).**
	The system appears to be no longer available. A Google search for 24/7 WebMed produced no results and the system does not appear on the supplier's current website (www.dshisystems.com).
4.	**Procedures: Describe each of the procedures, activities, and/or processes used in the intervention, including any enabling or support activities.**
	The system collected basic demographic data from users, including zip code, age and gender. Users the answered a series of questions based on algorithms. The system could analyse over 600 chief complaints, stratified by age and gender. The system classified assessments into six different levels of urgency: emergency, call 911; seek care immediately; seek care within 12–24 hours; seek care within 2–3 days; seek care within 1–2 weeks; and self-care recommended. After completing triage, students could request an appointment with SHS by e-mail.
	HOW
6.	**Describe how the system is accessed e.g. via Web pages, a remote computer, an app etcetera.**
	The system was accessed via a link from the SHS website.

TAILORING

9. Describe provision for particular disease groups or populations and how these differ from general provision.

Not reported.

MODIFICATIONS/VERSIONS

10. If the intervention was modified during the course of the study, describe the changes (what, why, when, and how).

Not reported.

HOW WELL

11. Simulation/Laboratory Testing: How the intervention was tested and by whom.

Reports of simulation testing were not available.

12.‡ Real world testing: How the intervention was tested and by whom.

Testing of the system in the setting of SHS at the University of Central Florida was described by Sole et al.[23]