

Mapping the Advancement of Safe Surgery



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“...to improve the safety of surgical care around the world...”

- Organized a team of international experts to improve surgical care worldwide



“...to advance public health through learning, discovery, and communication...”

- Selected by the WHO to lead the effort



“...to support research and education that relies on geographic information...”

- Approached by HSPH to provide mapping

The Surgical Safety Checklist

Surgical Safety Checklist



World Health
Organization

Patient Safety
A World Alliance for Safer Health Care

Before induction of anaesthesia

(with at least nurse and anaesthetist)

Has the patient confirmed his/her identity, site, procedure, and consent?

☐ Yes

Is the site marked?

☐ Yes

☐ Not applicable

Is the anaesthesia machine and medication check complete?

☐ Yes

Is the pulse oximeter on the patient and functioning?

☐ Yes

Does the patient have a:

Known allergy?

☐ No

☐ Yes

Difficult airway or aspiration risk?

☐ No

☐ Yes, and equipment/assistance available

Risk of >500ml blood loss (7ml/kg in children)?

☐ No

☐ Yes, and two IVs/central access and fluids planned

Before skin incision

(with nurse, anaesthetist and surgeon)

☐ Confirm all team members have introduced themselves by name and role.

☐ Confirm the patient's name, procedure, and where the incision will be made.

Has antibiotic prophylaxis been given within the last 60 minutes?

☐ Yes

☐ Not applicable

Anticipated Critical Events

To Surgeon:

☐ What are the critical or non-routine steps?

☐ How long will the case take?

☐ What is the anticipated blood loss?

To Anaesthetist:

☐ Are there any patient-specific concerns?

To Nursing Team:

☐ Has sterility (including indicator results) been confirmed?

☐ Are there equipment issues or any concerns?

Is essential imaging displayed?

☐ Yes

☐ Not applicable

Before patient leaves operating room

(with nurse, anaesthetist and surgeon)

Nurse Verbally Confirms:

☐ The name of the procedure

☐ Completion of instrument, sponge and needle counts

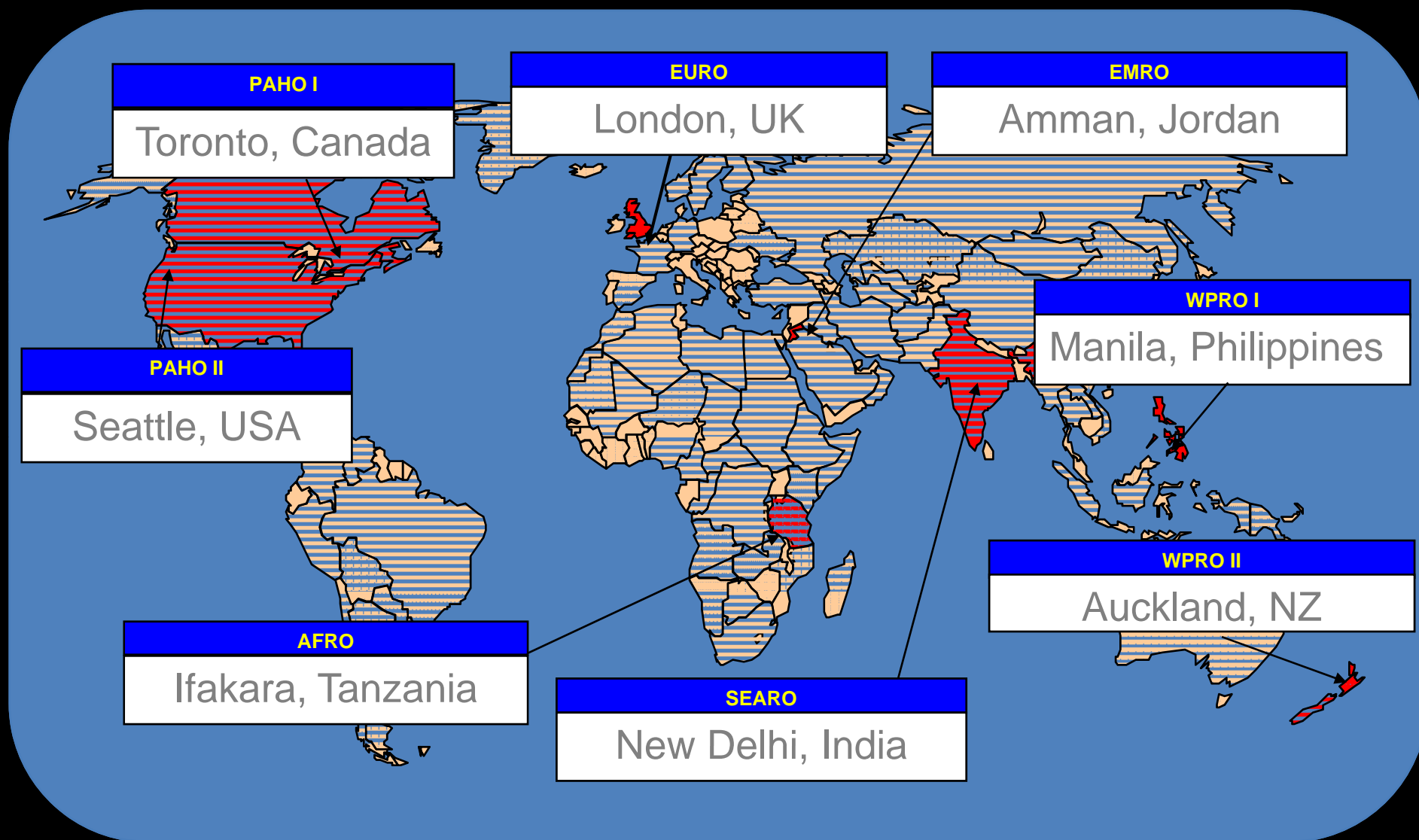
☐ Specimen labelling (read specimen labels aloud, including patient name)

☐ Whether there are any equipment problems to be addressed

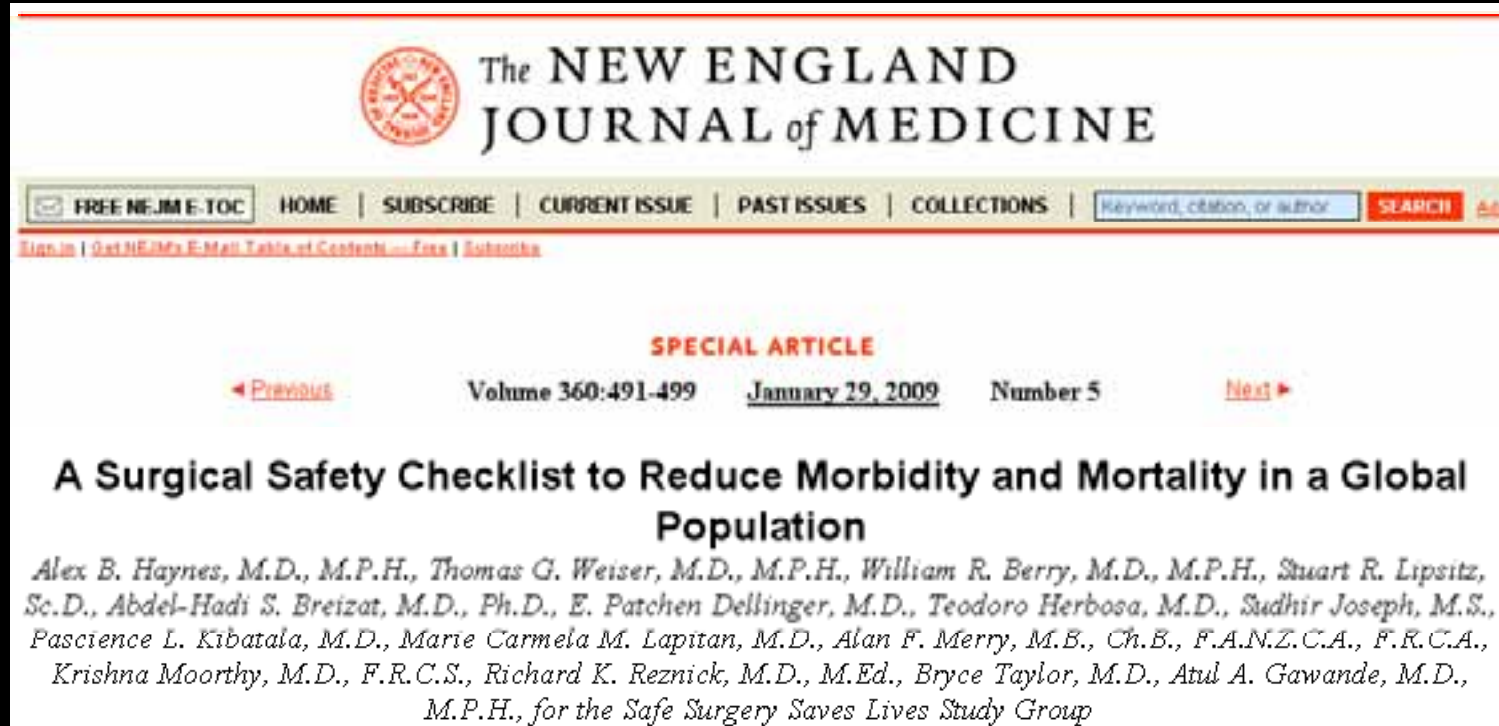
To Surgeon, Anaesthetist and Nurse:

☐ What are the key concerns for recovery and management of this patient?

Checklist implementation pilot sites



Pilot study results



The WHO Surgical Safety Checklist reduced the rate of deaths and complications by more than 33% in the eight pilot hospitals.



**WORLDWIDE
DISSEMINATION
EFFORT**

Worldwide Dissemination led by the Safe Surgery Saves Lives Team

Implementation Manual
WHO Sur

Safe Surgery S



Safe Surgery Saves Lives FAQ

Welcome!

global surgical safe
overview questions
initiative. Once you
your institution – w
a number of questio
Checklist where the

Home Materials Register/Map News Related Programs Contact Us

Materials > Videos

Background FAQ

1. *Q: Why is the C*
A: 234 million
translates to rou
care is of signifi
implications, see
www.who.int/p

How to Use the Checklist

WHO Safe Surgery Saves Lives Checklist



- Antibiotics have been given!
- A gram of Ancef was in 5 minutes ago.

YouTube

How NOT to Use the Checklist



YouTube

Yes, a map

1) For use by the Safe Surgery Saves Lives Team

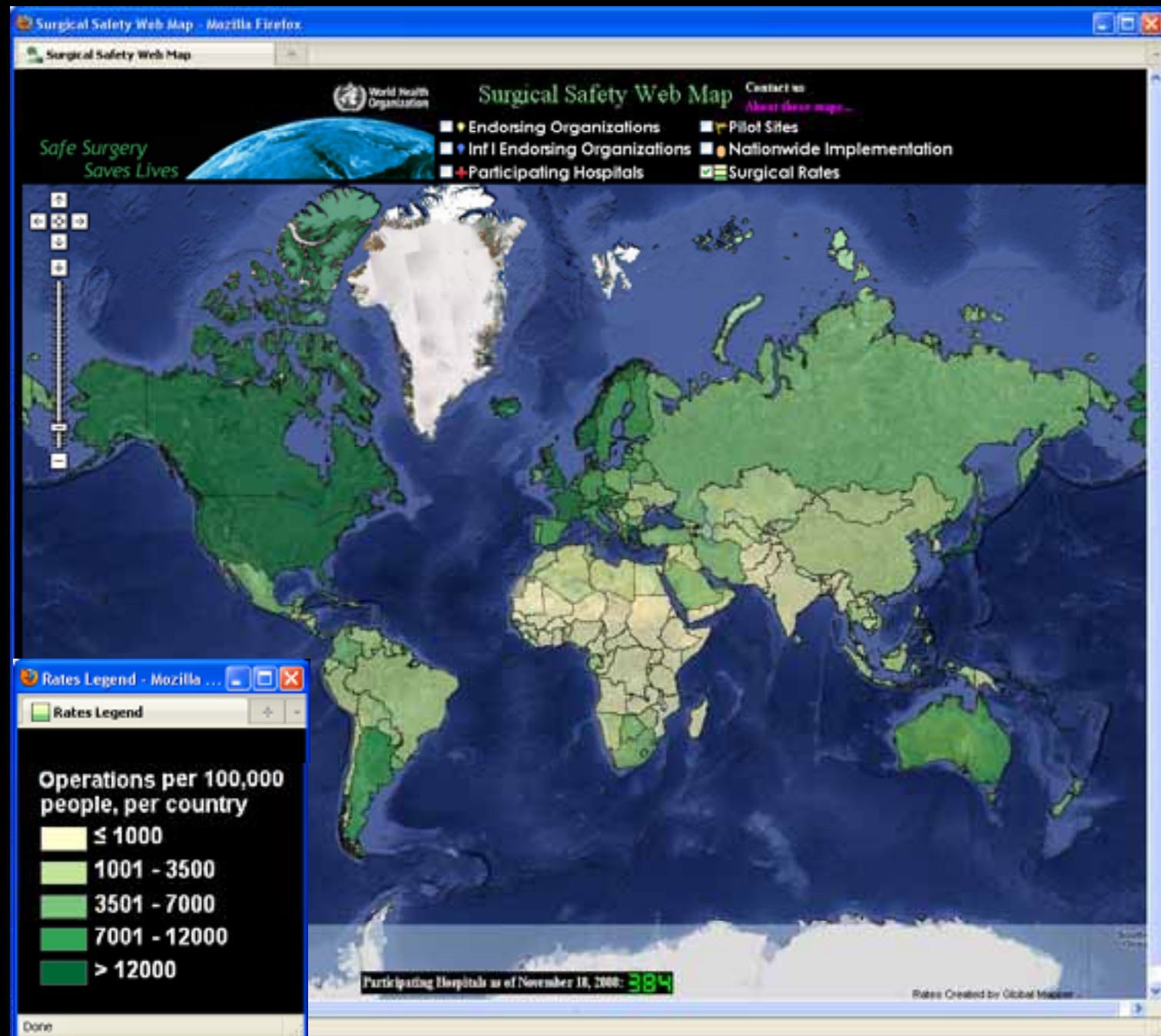
- Track checklist dissemination
- Maintain database of checklist registrants

2) For use by hospitals to get a sense of participating hospitals/checklists in the surrounding area.

- On the web
- Pilot site markers
- Operations per country thematic overlay.
- Participating hospitals and organization locations
- Clickable information window pop-ups for each location

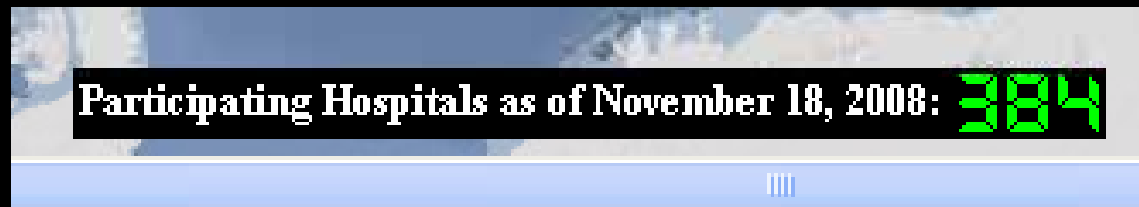
	A	B
1	Country	Rate
2		(Surgeries per 100,000)
3	Afghanistan	215.0110028
4	Albania	3180.07126
5	Algeria	1899.772097
6	Andorra	14279.59897
7	Angola	252.3188208
8	Antigua and Barbuda	4034.091973
9	Argentina	7254.021752
10	Armenia	2358.84741
11	Australia	9048.877832
12	Austria	13992.45175
13	Azerbaijan	1637.4803
14	Bahamas	7202.957275
15	Bahrain	6185.927387
16	Bangladesh	192
17	Barbados	6621.720365
18	Belarus	3654.545347
19	Belgium	10414.24222





Initial Surgical Safety Web Map

- Built on the Google Maps API (javascript, html)
- Hospitals geocoded using Batchgeocode.com
- Point markers in KML format - imported Batchgeocode.com lat/long values to ArcMap, exported to KML
- Participating hospitals counter KML screen overlay



- Surgical Rates map created in ArcMap, loaded into Global Mapper, exported as a tile cache.

Initial Surgical Safety Web Map

BENEFITS:

- The Safe Surgery Saves Lives team can visualize active checklist users and institutions that have expressed interest in using the checklist.
- Allows the team to strategize their dissemination efforts and make plans to target areas that have not been introduced to the Surgical Safety Checklist.

CHALLENGES:

- Updating the map to reflect the rapid adaptation of the checklist
 - New registrants want to see their hospital on the map
 - Safe Surgery Saves Lives team relies on the map for the latest registration information
 - Limited data display with KML format
- Display basic hospital info to the public, and ALL hospital information to the SSSL team.

Enabling user updates to the map

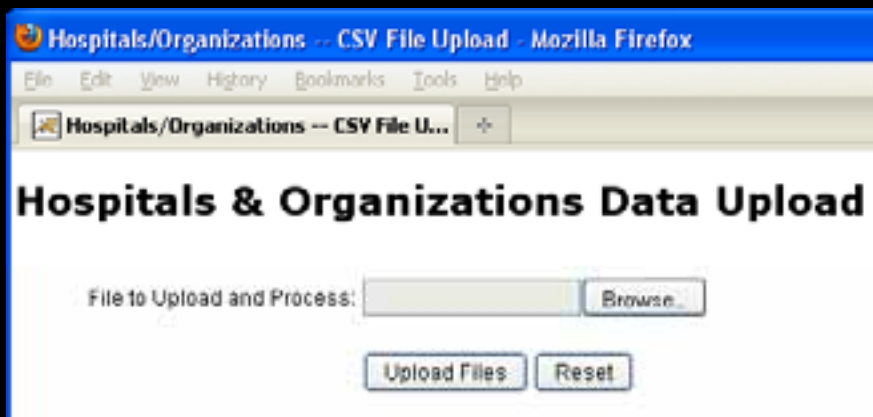
- Migration from KML to PostGIS / WMS
- Batchgeocode.com training for SS team.

Geocoding and Batch Upload Instructions for Surgical Safety Web Map April 28, 2009

Geocode the new Hospitals and Orgs (obtaining latitude, longitude values)

1. Open the Hospitals to be added in a blank Excel file, and sort by Country.
2. Select all U.S. addresses, and copy / paste into a new workbook.
3. Select all non-U.S. addresses and copy / paste into a new workbook.
4. Go to <http://batch-geocode.com>

- Web forms for uploading new hospitals in CSV format, and updating the hospital counter.



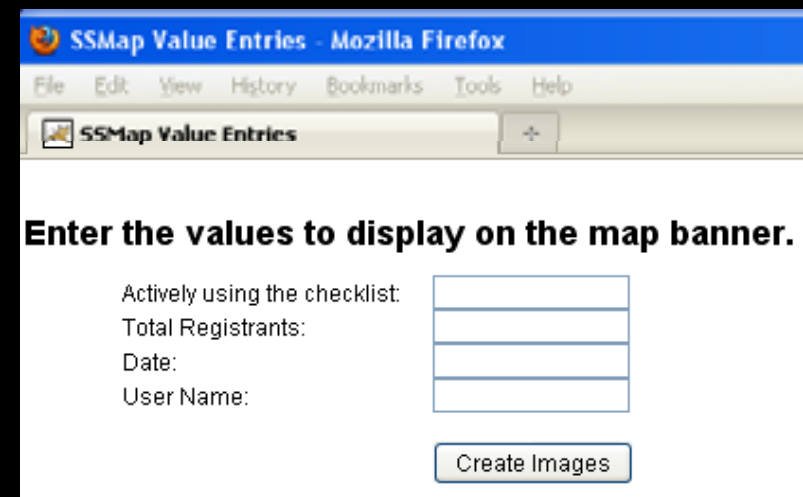
Hospitals/Organizations -- CSV File Upload - Mozilla Firefox

File Edit View History Bookmarks Tools Help

Hospitals/Organizations -- CSV File U...

Hospitals & Organizations Data Upload

File to Upload and Process:



SSMap Value Entries - Mozilla Firefox

File Edit View History Bookmarks Tools Help

SSMap Value Entries

Enter the values to display on the map banner.

Actively using the checklist:

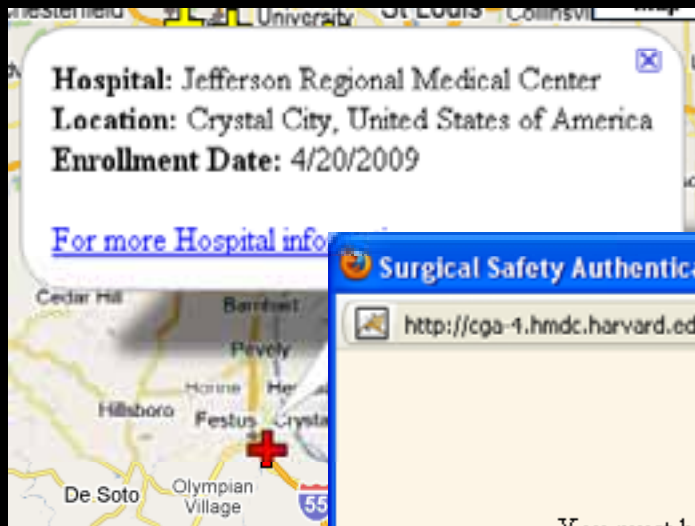
Total Registrants:

Date:

User Name:

Enabling user updates to the map (cont.)

- Allowing editing of individual hospital info



A dialog box titled "Surgical Safety Authentication - Mozilla Firefox" is shown. It contains the following text and fields:

Login: You must be authenticated to view and edit restricted data.

User Name

Password

Done

A web browser window titled "Data Edit - Mozilla Firefox" showing a form titled "Hospital Data". The form contains the following fields and values:

Hospital Data	
Close	
Record ID	12816
Hospital ID	<input type="text" value="3115"/>
Hospital	<input type="text" value="Jefferson Regional Medical Cente"/>
Country	<input type="text" value="United States of America"/>
Address	<input type="text" value="1400 Highway 61 South"/>
City	<input type="text" value="Crystal City"/>
State/Region	<input type="text" value="Missouri"/>
Postal Code	<input type="text" value="63019"/>
Telephone	<input type="text" value="(636) 933-1035"/>
Fax	<input type="text" value="(636) 933-1821"/>
Who Region	<input type="text"/>
Contact	Display contact info...
Registration Date	<input type="text" value="4/20/2009"/>
Implementation Date	<input type="text"/>
WHO Patient Safety Projects Introduced	<input type="text"/>
Actively Using patient safety checklist?	<input type="button" value="Plan to Test"/>
Number of Operating Rooms	<input type="text" value="4"/>

Additional enhancements

- Displaying the hospitals by participation status

Surgical Safety Web Map

+Actively using the checklist: 1640

+Total Registrants: 3847 5-27-2010

- Zoom Box
- Google search bar
- WHO logo, disclaimer, and map overlay
- Banner redesign, sidebar addition
- Dynamic hospital list display

More...

- Highlight WHO Regions
- Database query
- Map symbology
- Cluster display



More...cluster display



Conclusions

- A team of public health research professionals empowered by geographic information.
 - Incorporates the map into daily workflow
 - Enables better communication, information distribution

Technologies used:

Google Maps javascript API

Mapserver

ArcGIS Server

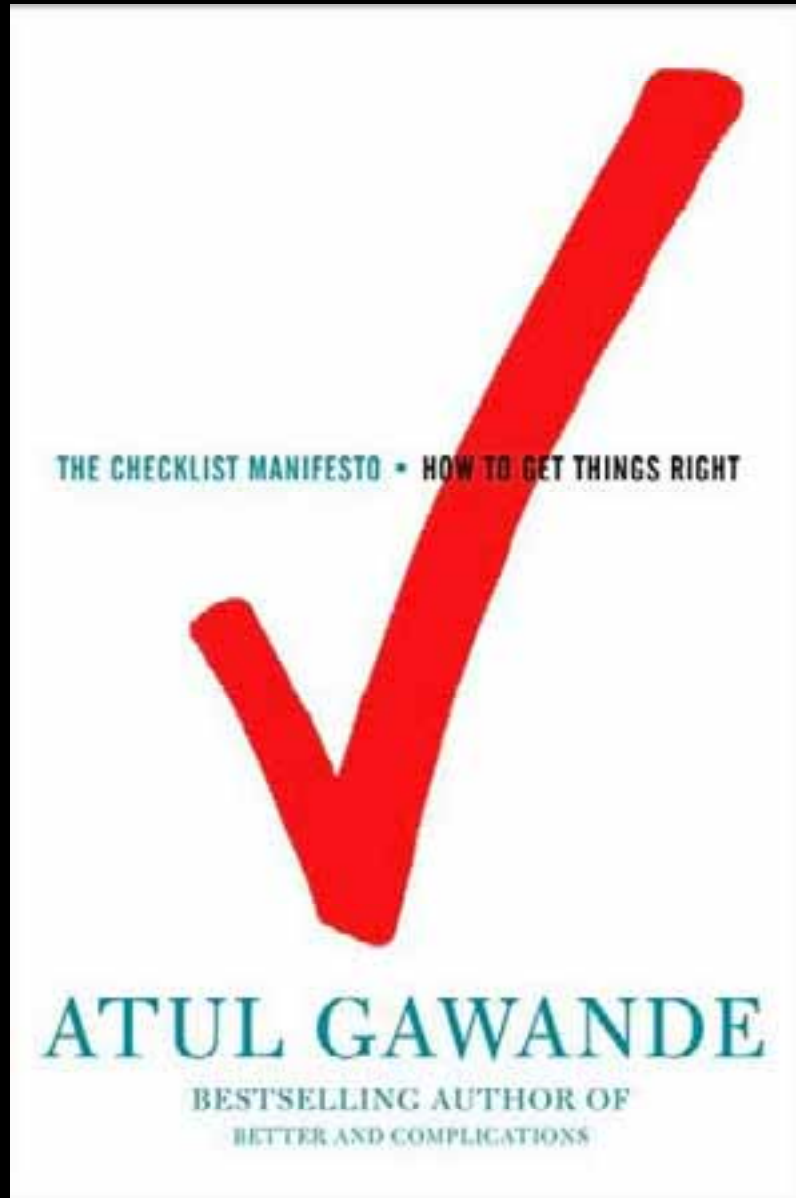
Global Mapper

Java

PostGIS

ArcGIS Desktop

Batchgeocode.com



“The Checklist Manifesto - How to Get Things Right”

....managing complexity through the use of simple checklists....

- The Checklist to date (6/4/2010): 3,847 registrants representing 120 countries, and 1,640 institutions actively using the checklist.

Contact Info:

Surgical Safety web map: http://maps.cga.harvard.edu/surgical_safety
Or Google “surgical safety web map”

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