

# The AsiaFluCap Project

## Development of a model to determine resource depletion during a pandemic: the AFC Simulator

Mart L. STEIN, Charlie van der Weijden, Mirjam Kretzschmar, Axel Bonacic Marinovic, Mehdi Alkadhimi, Ralf Krumkamp, James Rudge, Piya Hanvoravongchai, Irwin Chavez, Andre Jacobi, Richard Coker, Aura Timen

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### Project objectives:

- \* to provide a strategic framework to evaluate operational capacity in countries at risk of influenza pandemic
- \* to determine systematically operational capacity gaps in order to support containment and to mitigate the consequences of pandemic influenza in these countries and elsewhere

### Study countries:

Cambodia, Indonesia, Lao PDR, Taiwan, Thailand, and Vietnam

### Project timeline:

May 2008 to April 2011

### Project Co-ordinator:

Prof. Richard Coker

### Contact Information:

Communicable Diseases  
Policy Research Group, LSHTM,  
9th Floor, Anek Prasong Bldg.,  
420/6 Rajvithi Road, Bangkok  
10400 Thailand  
Tel/Fax: +66 2 354 9195  
Email: bkk@cdprg.org  
http://www.asiafluicap.org

**Background** Pandemic influenza remains a challenge for countries around the globe. This is especially the case in South East Asia where sporadic human cases of H5N1 cases still occur. The level of pandemic preparedness has a direct impact on the effectiveness of local as well as global disease control. Data about health care resource needs, gaps, and the best way to improve outbreak response are important to practically support local policy-makers in pandemic planning. As part of the AsiaFluCap project, we aimed at producing a simulator tool for assessing health system capacity in order to respond to pandemic influenza.

**Methods** We combined a deterministic compartmental SEIR model (developed by R. Krumkamp et al. 2011) with a resource depletion model (fig. 1). The AFC Simulator was built in MS Excel® and has MS Visual Basic® shell, making the simulator easily accessible. The simulator has an export function to GIS software to create maps.

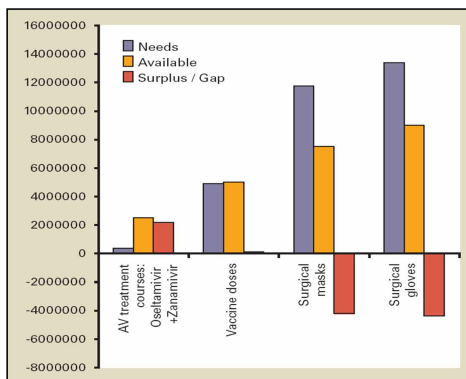


Figure 2 Example of impact on healthcare resource capacity calculated by the AFC Simulator. The available, needs and gaps of depleting resources over the total pandemic

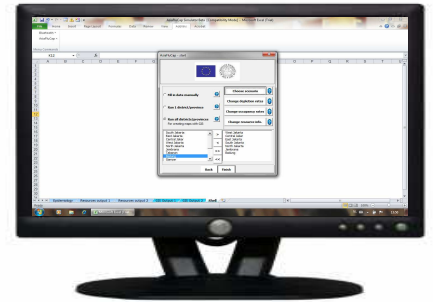


Figure 3 Example of the AFC Simulator shell

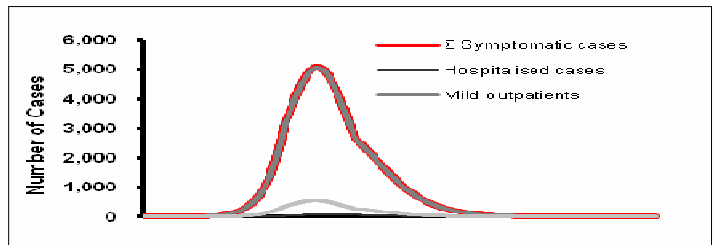


Figure 4 Example of impact on public health for a selected pandemic influenza scenario, calculated by the AFC Simulator

**Results** The AFC Simulator is able to estimate and display the availability, needs, and gaps of 29 key health care resources (e.g. materials, equipment and personnel) for a selected pandemic scenario in a country, province, or region. Users can select a mild pandemic scenario (based on H1N1 parameters, as reported in the literature) or a more severe pandemic scenario (based on H5N1 parameters). In a few simple steps, users can export simulator output to GIS software to create maps to guide resource allocation and mobilisation. The AFC Simulator could be used for informing strategic and operational plans in order to improve pandemic preparedness and response. Next to this, the AFC Simulator is applicable for training and exercises (e.g. for decision-making and 'war-room' situations).

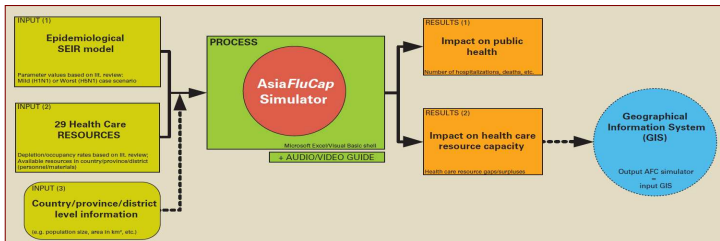


Figure 1 Schematic overview of the AFC Simulator

**Conclusions** The combination of a mathematical model with multiple resources and linkage to GIS makes the AFC Simulator unique compared to existing pandemic prediction models. The user-friendly AFC Simulator can be easily employed by policy makers, policy advisors, donors, and other stakeholders involved in pandemic preparedness and healthcare resource allocation at regional, national or local levels. There is potential for further expansion of the AFC Simulator for other scenarios, diseases and resources.

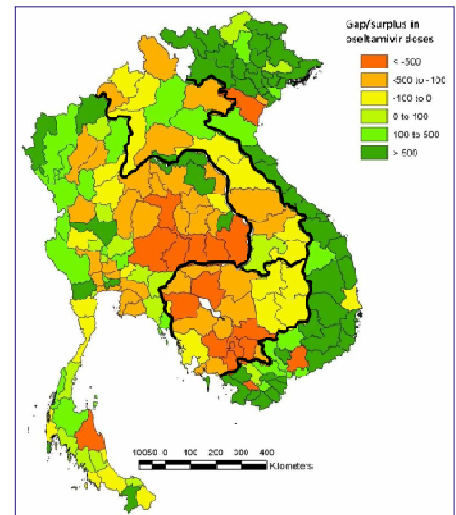


Figure 5 Example of a GIS map created with AFC Simulator output

### Project collaborators:

