



Models of Infectious Disease Agent Study (MIDAS)

Funded by the National Institute of General Medical Sciences, NIH, MIDAS is a collaborative network of research scientists who use computational, statistical, and mathematical models to understand infectious disease dynamics and thereby assist the nation to prepare for, detect, and respond to infectious disease threats.

MIDAS HAS A THREEFOLD MISSION

Research

MIDAS mobilizes its intellectual capital to undertake a variety of projects, many beyond the scope of any individual group, and conducts research on

- Dynamics of emergence and spread of pathogens
- Identification and surveillance of infectious diseases
- Effectiveness and consequences of intervention strategies
- Host/pathogen interactions
- Ecological, climatic, economic, and evolutionary dimensions of infectious diseases
- The roles of behavior and behavioral adaptation in the spread and control of infectious diseases
- Novel modeling approaches
- Production and dissemination of modeling and analysis tools for the scientific research community
- Approaches to analyzing and comparing model structure and output.

Education, Training, and Outreach

MIDAS builds capacity and infrastructure for infectious disease modeling through programs to

- Engage public health and medical professionals, policy makers, and the scientific community to understand the roles and utility of modeling
- Provide educational, training, mentoring, and career development opportunities in modeling infectious diseases
- Deepen modelers' understanding of public health, medical, and policy interests
- Facilitate exchange of personnel between public health, medicine, policy, and academia
- Foster international cooperation and collaboration on prevention and control of global infectious disease threats.

Policy and Decision Support

MIDAS supports planning, preparedness, and response activities through

- Collaboration with stakeholders to provide policy and decision support
- Generation of analytical and decision support tools for use by the public health community
- Sharing results and resources with the MIDAS network, policymakers, public health, medical, and scientific communities
- Critical analyses and scenarios to inform policy decisions and guidance.

RELEVANT PAST MIDAS POLICY PROJECTS

MIDAS has conducted modeling and analyses to address policy questions on influenza at the request of the Centers for Disease Control and Prevention, the Department of Health and Human Services, and the National Security Council.

- *Are community containment strategies robust enough to mitigate a pandemic in the United States assuming limited antivirals and no vaccine?* This policy question allowed MIDAS to compare the behavior of three independently developed large-scale computational models. All of the models strongly supported the conclusion that community containment strategies can reduce the spread of a flu.
- *What combination of interventions are capable of containing or slowing a pandemic?* MIDAS studied the effectiveness of vaccines, antiviral use, travel restrictions, and quarantine to reduce spread of a flu pandemic.
- *What is the impact of school closure as a mitigation strategy during an influenza pandemic?* MIDAS developed a computer simulation model to explore the effects of school closure strategies. While entire school system closures were not more effective than individual school closures, maintaining closure for at least 8 weeks could delay the epidemic peak and provide additional time to implement a second more effective intervention such as vaccination.
- *Under what conditions would a federal program to sell antivirals reduce the spread of a pandemic?* MIDAS results indicated that distribution through the marketplace is less effective in reducing spread than either random or targeted distribution.

MIDAS ORGANIZATION

National Centers of Excellence in Infectious Disease Modeling. Centers at the Harvard School of Public Health and the University of Pittsburgh School of Public Health provide leadership nationally and internationally in the following areas: (1) infectious disease modeling; (2) computational, mathematical, and statistical methods; (3) public policy; and (4) outreach and training.

Research Project Grants. Eight investigator-initiated research projects focus on (1) infectious disease modeling and (2) computational, mathematical, and statistical methods.

Information Technology Resource. Shared support provided by RTI International includes (1) software development, (2) data management, and (3) development of central resources (e.g., synthetic populations, demographic information).

For more information about MIDAS

MIDAS Web Site: <http://www.midasmodels.org>

MIDAS Web Site Administrator: tfarris@rti.org

National Institute of General Medical Sciences (NIGMS): <http://www.nigms.nih.gov/Research/FeaturedPrograms/MIDAS/>

MIDAS Scientific Director at NIGMS: Irene Eckstrand, eckstrai@nigms.nih.gov

The MIDAS Research Network

