
DataHealth Pakistan

Disease Mapping in Lahore Pakistan

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Motivation

- Desire to apply statistics knowledge to serve those in need
- Simple Techniques can be used to prevent many needless morbidities and mortalities
- Desire to bring healthcare services to the underserved

Why Lahore, Pakistan?

- Over 250,000 deaths due to diarrhea
- Over 300,000 deaths due to diseases such as TB, measles, whooping cough, and pneumonia
- Health expenditure per capita was \$16 in 1999 and \$13 in 2003
- National Health Management Information Systems (NHMIS)

Project Overview: Innovative Data Tracking

- Uses data from public hospitals and cross references it with socioeconomic information
- Constructs maps that identify highly vulnerable communities
- Targets vulnerable communities for improved healthcare

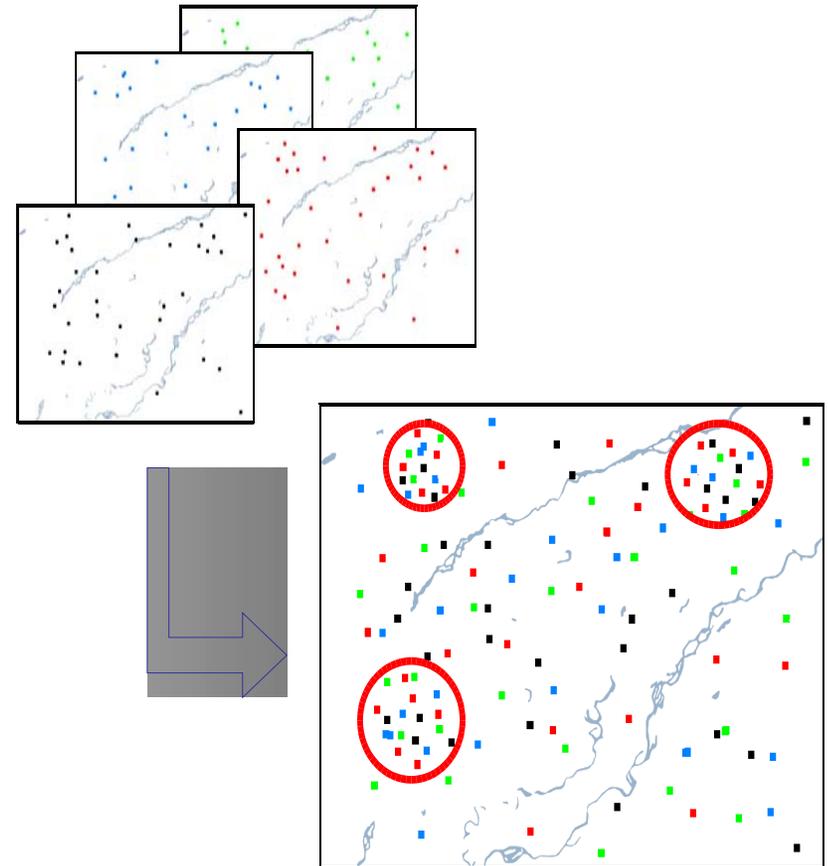
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Please see "Seasonal Awareness and Alert Letter, 2nd issue."
Islamabad, Pakistan: National Institute of Health, February-May 2005.

<http://www.nih.org.pk/publications/dews%202nd%20issue.pdf>

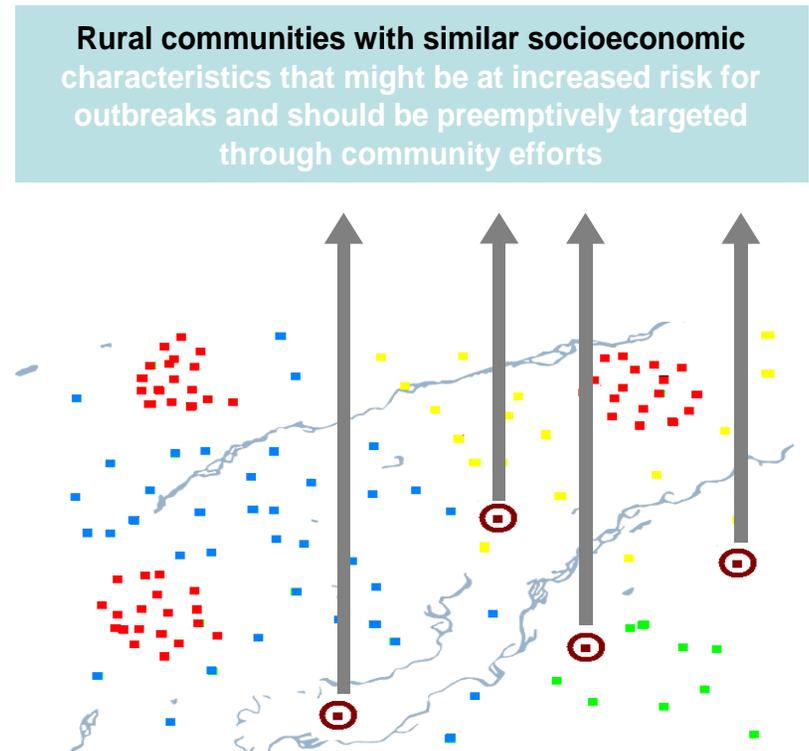
Phase I: Data Interface

- Pool together information from public hospitals and NHMIS
- Collect data for major respiratory, diarrheal, and venereal diseases
- Collected information to include disease details as well as geographic location of patient
- Develop high resolution map of geographical distribution of diseases



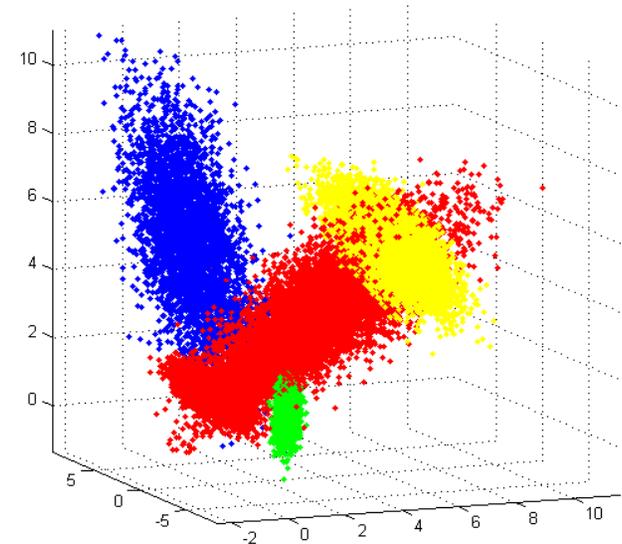
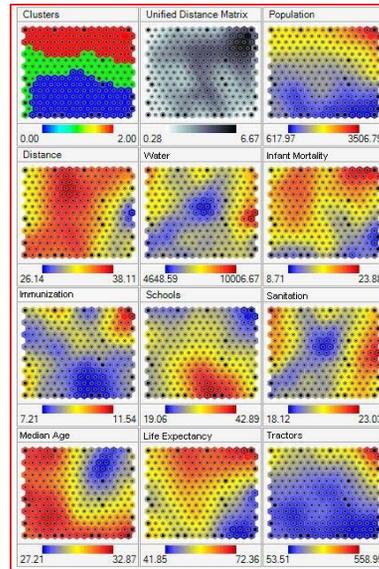
Phase II: Data Analysis

- Use information to identify underserved communities and discover disease outbreak patterns:
 1. Identify areas prone to outbreaks but lack onsite medical facilities
 2. Identify how frequently diseases occur within geographical community classes
 3. How frequently patients visit hospitals once cases have been reported



Sample Analysis

Statistical Analysis: Advanced PCA Techniques



| Community/ | Socioeconomic Indicators | | | | | |
|---------------------|--------------------------|--------------|-----------|--------------|-------------|--------------|
| | Water | Median | Schools | Sanitation | Population | Infant |
| Manga Pathar | 9996 | 31.64 | 39 | 22.77 | 3476 | 22.51 |
| Mojoki | 7091 | 29.56 | 33 | 20.64 | 1987 | 14.39 |
| Utaarh | 4805 | 28.07 | 21 | 18.65 | 854 | 9.10 |
| Ghuwind | 8858 | 30.99 | 40 | 22.84 | 3389 | 21.68 |
| Theh Janab | 6899 | 29.23 | 31 | 19.97 | 1812 | 13.33 |

Phase III: Reporting findings to guide community-based efforts

- Communicate findings to Ministry of Health as well as NGO's and similar organizations
- Select representative from communities to promote community based projects for awareness regarding first-line defense mechanisms for disease

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Please see "Where There is No Doctor." Berkeley, CA: The Hesperian Foundation, 2007.

http://www.hesperian.org/publications_download_wtnd.php



Budget

| | \$ |
|---------------------------------------|----------------------|
| Income: | |
| PSC Fellowship | 4,000 |
| DLab Fund | 1,000 |
| | 5,000 |
| Expenses: | |
| Technical Requirements: | |
| Computers, Software, and Office Space | 0.00 |
| Internet Connection | 240 (12mo. x \$20) |
| Equipment | 500 |
| Services: | |
| Data Entry | 2400 (12mo. x \$200) |
| Printed Info. For Communities | 300 |
| Community Incentives and materials | 1200 |
| Transportation | 365 |
| Mailing Costs | 100 |
| | 5105 |
| Net | -105 |

Community Partners and future outlook

- Advisory Board:
 - John Guttag: Leads Data-Driven Medicine group at MIT CSAIL
 - Jonathan Rosen, MD: Harvard-MIT HST, Executive Director of BU's ITEC
 - Susan Murcott: MIT Civil and Environmental Engineering
- Lahore Hospital Partners:
 - Shalimar Hospital: 1,000 Patients per day
 - Gulab Devi Hospital: Biggest TB treatment center in South Asia
- \$5,000 raised in capital so far
- 2 members traveling to Lahore this summer
- Data collection to begin...

Questions?

MIT OpenCourseWare
<http://ocw.mit.edu>

EC.715 D-Lab: Disseminating Innovations for the Common Good
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