

Department of Defense
Prescription Pharmacy Data:
A Prescription for the
Surveillance of Respiratory &
Gastrointestinal Illness?

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Abstract

This study examines the feasibility of using the Department of Defense (DoD) Pharmacy Data Transaction Service (PDTs) database as a tool for detecting respiratory and gastrointestinal (GI) illness among beneficiaries of the DoD health care system in the National Capital Area (NCA – consisting of Washington, D.C. and parts of Maryland and Virginia). This prescription data is compared with outpatient appointment data from the DoD's Ambulatory Data System (ADS). ADS data is currently used in the DoD's Early Notification of Community-based Epidemics (ESSENCE) syndromic surveillance system. Study of the PDTs database will determine the appropriateness of incorporating PDTs into ESSENCE.

Two syndrome groups, respiratory and GI, were chosen for the study. Graphical and statistical analysis, using Pearson's Correlation Coefficient, showed significant positive correlation between PDTs and ADS respiratory syndrome group data for all time periods studied. There was also significant positive correlation for the GI syndrome group in all time periods, except for weekends.

This study demonstrates the potential for incorporating prescription medication data into the DoD's ESSENCE surveillance system.

Early Notification of Community-based Epidemics (ESSENCE)

- A Department of Defense (DoD) surveillance system that uses outpatient ICD-9-CM diagnoses and clusters them into 7 syndrome groups
- Information currently obtained from the DoD Ambulatory Data System (ADS) which can have a 1-3 day transmission time

ESSENCE – A System of Systems



- DoD's **Pharmacy Data Transaction System** (PDTS) captures all prescription medicines dispensed through the DoD system with a **3.2 second** transmission time between prescription being filled and into central database and also includes civilian network pharmacies
- How well does PDTS data correlate with ADS data for the detection of infectious disease outbreaks?

Methods

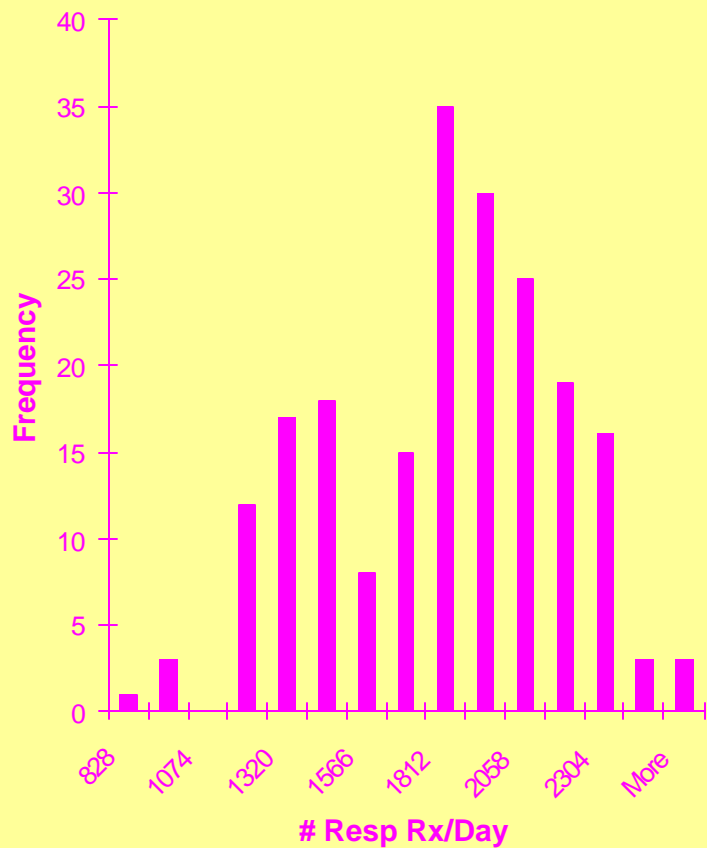
- Using Pearson's Correlation, a secondary data analysis was performed comparing ambulatory visit data with PDTS data from July 2001 through April 2002
- The study population consisted of beneficiaries of the DoD managed healthcare system with prescriptions dispensed in the National Capital Region (greater Washington, D.C.)
- The study was limited to the Respiratory and GI syndrome groups of the ESSENCE system because of their natural seasonal outbreaks

Methods

- Identification of prescribed medications using the pharmaceutical GC3 (General Classification) system
 - 478 respiratory medications → 34 respiratory GC3 codes
 - 93 GI meds → 8 GI GC3 codes

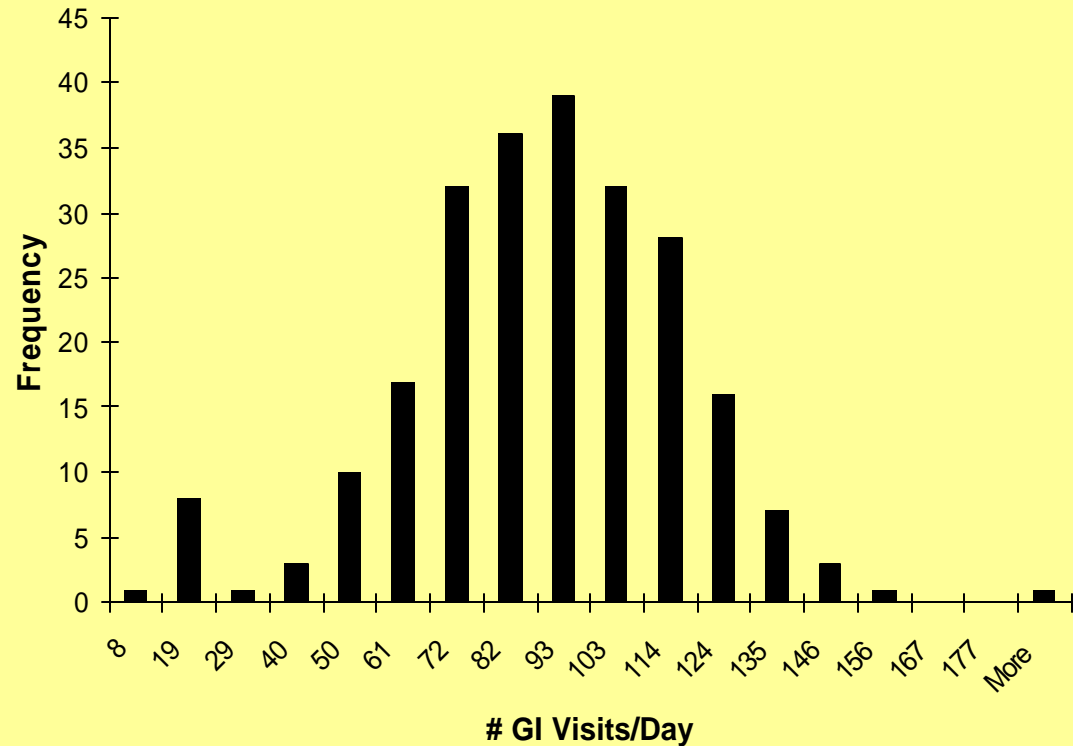
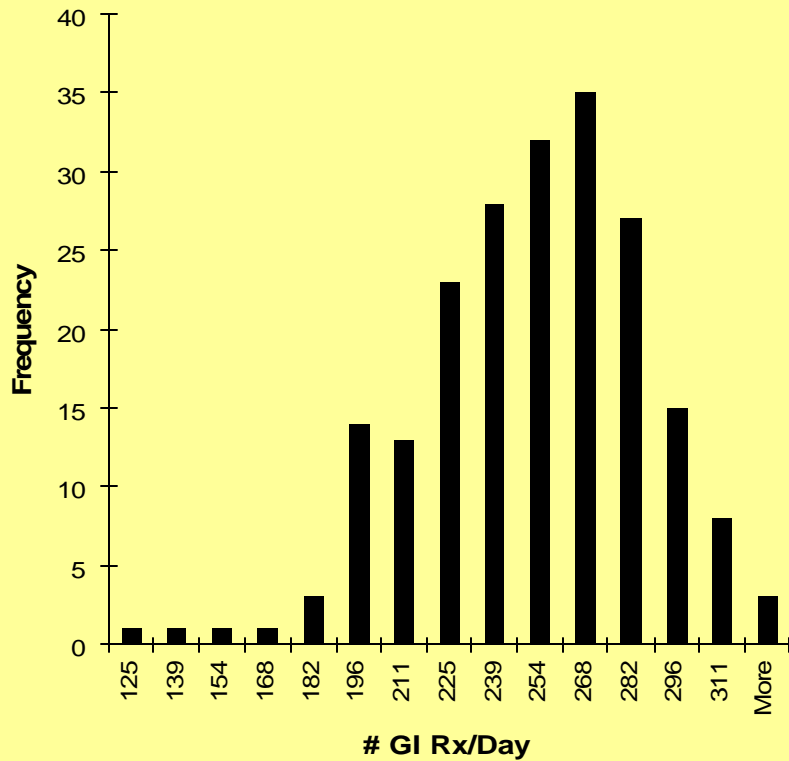
Respiratory Prescriptions & Visits

Minus Weekends & Holidays

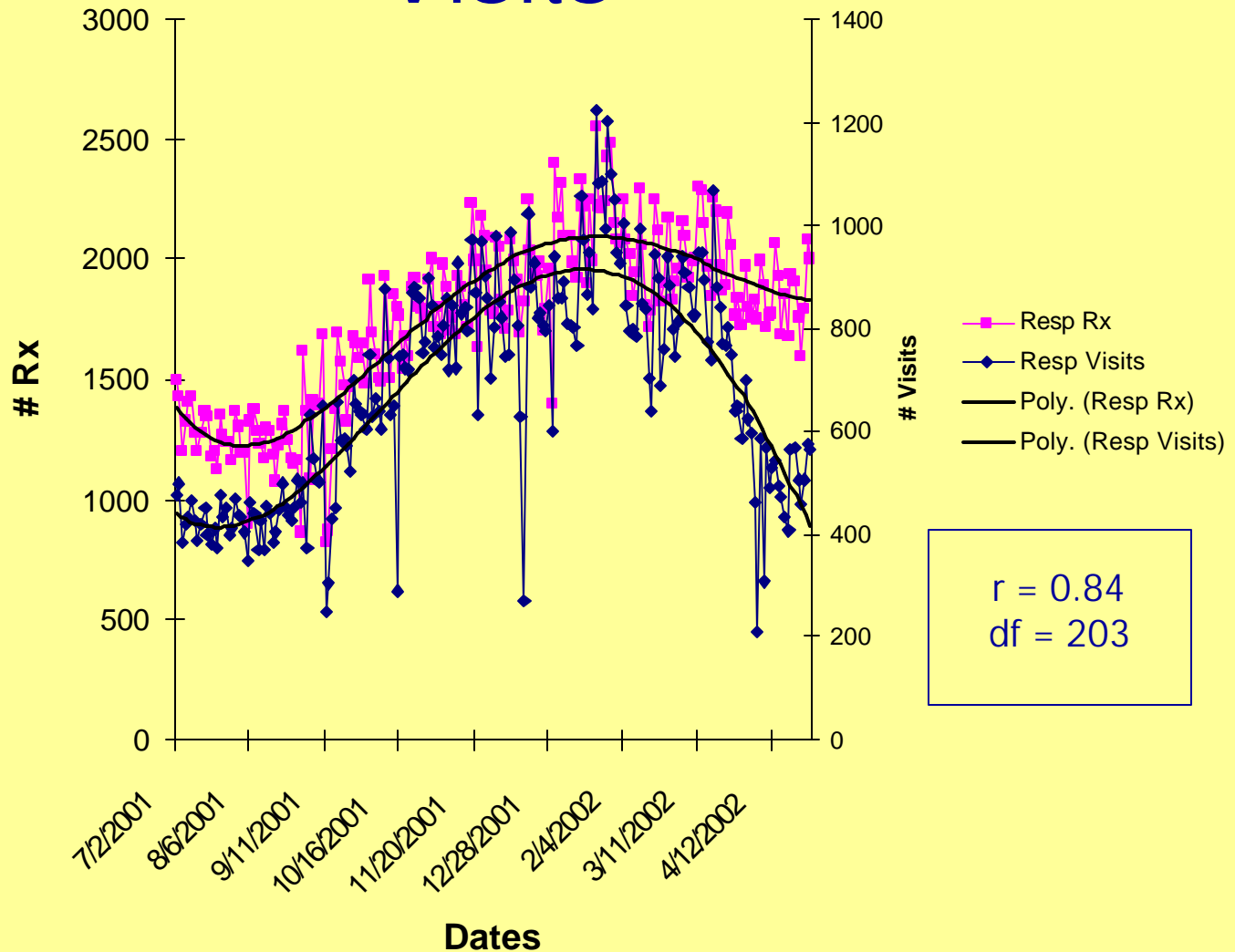


GI Prescriptions & Visits

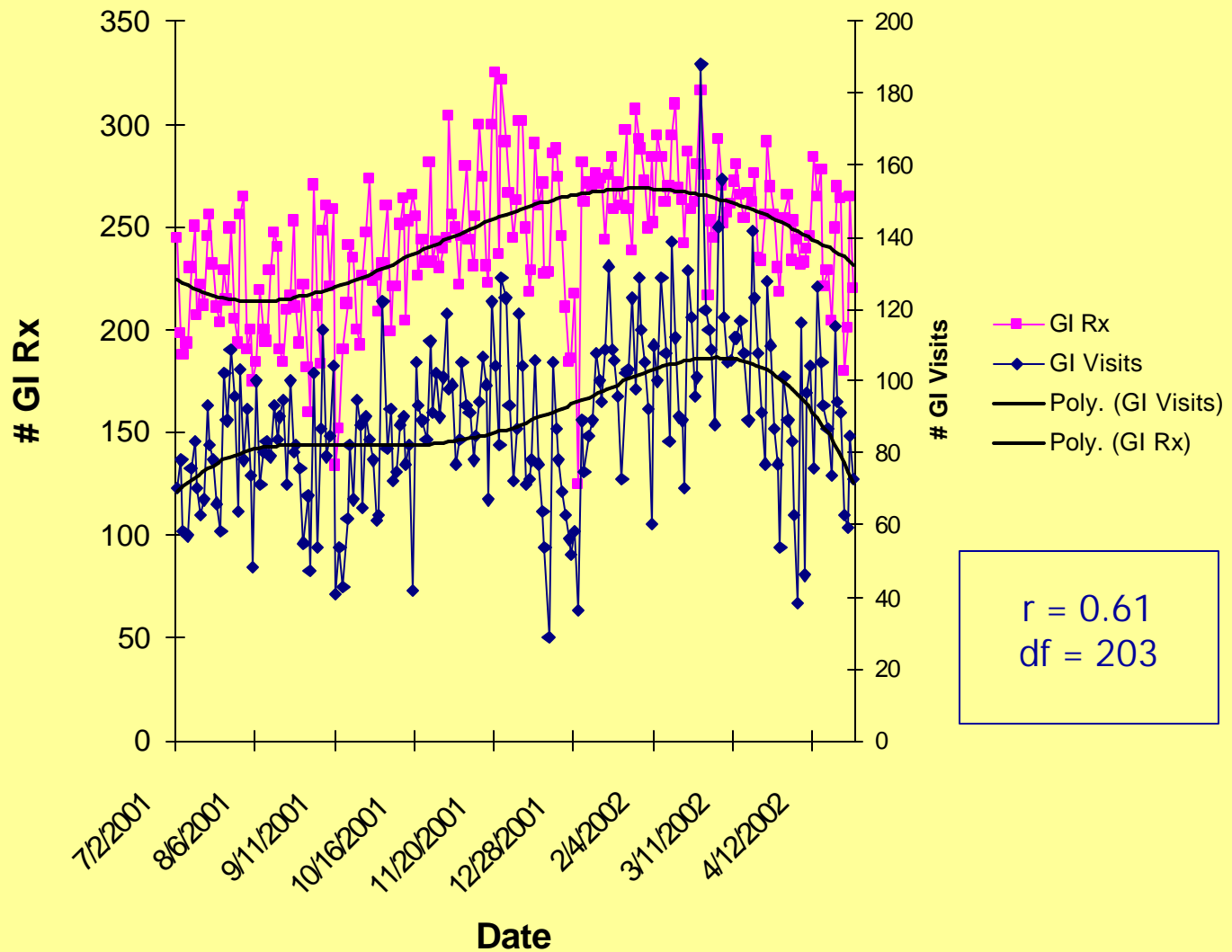
Minus Weekends & Holidays



Correlation Between Respiratory Prescriptions & Visits



Correlation Between GI Prescriptions & Visits



Results

Respiratory Correlation

$$r = 0.84$$

$$df = 203$$

GI Correlation

$$r = 0.61$$

$$df = 203$$

Weekends

Resp $r = 0.78$

GI $r = 0.19$

$$df = 85$$

Holidays

Resp $r = 0.94$

GI $r = 0.65$

$$df = 11$$

Limitations

- Medications may fit into more than one syndrome group
- Only respiratory and GI syndrome groups studied
- Timeliness of information not validated

Conclusions

- PDTS data significantly correlates with ADS data for both respiratory and GI syndrome groups
- The GI data had lower correlation than the respiratory data, possibly because GI meds are less likely to be prescribed and chronic meds not included in study
- 34 respiratory & 8 GI GC3 codes identified as surrogates for individual medications

Future Studies

- Refine specific medications and codes –
Need to determine which medications produce the most efficient surveillance model and any subsequent changes needed in the coding system
- Timeliness – While PDTS transmission time is much quicker, time from prescription written until data analyzed is still unknown
- Include other syndrome groups in analysis