

# **Examination of Key Factors Among Hospital Norovirus Gastroenteritis Outbreaks Maryland, 2004**

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May 4, 2005

# Introduction – Norovirus in the Media

## UMD Concerned Over Additional Norovirus Case

Concern is growing at the University of Maryland after yet another person in another building on campus has become ill with a suspected case of the Norovirus.

## Norovirus Found To Cause Traveler's Diarrhea

A majority of traveler's diarrhea cases among U.S. travelers to Mexico and Guatemala were attributed to Norovirus.

## Faculty outbreak at U. Maryland linked to Norovirus

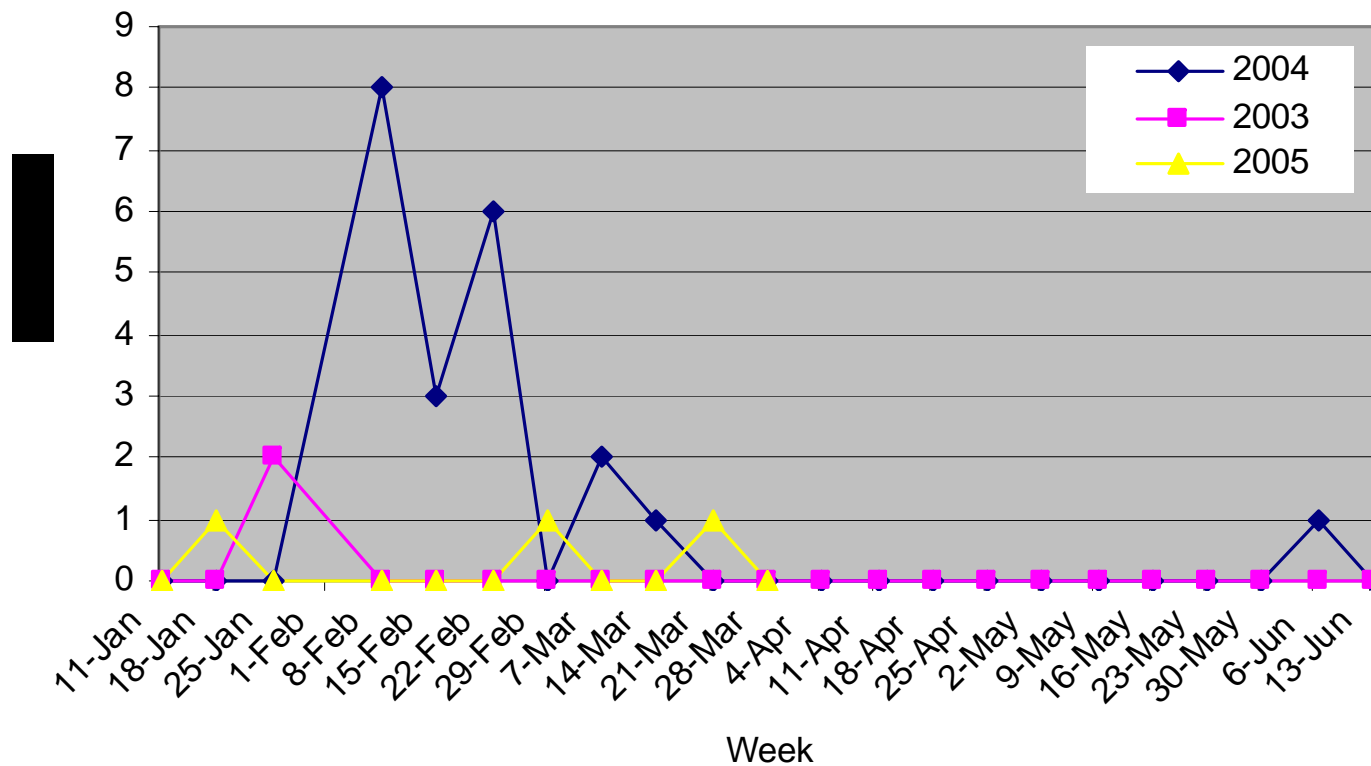
Prince George's County health department officials Tuesday linked the 60-member architecture faculty's illness of last week to the Norovirus that struck about 100 high school students earlier this month.

## Norovirus outbreak hits 1,252 people in Las Vegas hotel-casino

A Norovirus outbreak at a Las Vegas Strip hotel-casino had affected over 1,200 people, health officials reported

# Background – Hospital NV in Maryland

Reports of Hospital NV Outbreaks per Week in Maryland During Early 2003, 2004, and 2005



# Background – Hospital NV in Maryland

- A large hospital NV outbreak occurred in early February 2004 and was reported to DHMH
- It is now known that a more virulent form of NV GII/4 strain was circulating in the state
- Enhanced surveillance began
- Hospital NV increased in early 2004 compared to early 2003 (by 650%)

# Objectives – What caused this increase?

- This study evaluates what caused this increase
  - Surveillance Bias?
  - Increased presence of NV in the community (possibly of increased virulence)?
  - Poor infection control practices?

# Methods - Design

- Retrospective review of 21 of 26 Hospital GE outbreaks occurring in early 2004
  - Other causes were found for 2 outbreaks: Rotavirus and *Clostridium* Difficile
  - Sufficient data not available to reliably report on the remaining 3
- Case and outbreak status were developed by DHMH (case criteria were sensitive)

# Methods – Data collection

- Data collected retrospectively after the development of a more complete outbreak summary report
  - DHMH outbreak files
  - LHD outbreak files
  - ICP interviews and questionnaires

# Methods – Analysis

- Analyzed using Microsoft Excel and Stata
  - Epidemiologic analysis using Excel
  - Un-paired t-test to analyze the affect of 5 infection control practices on the magnitude and duration of the outbreaks
    - Staff exclusion for 72 hrs after NV resolved
    - Staff leave (3 free days off)
    - Used recommended cleaning regimen
    - Development of additional guidelines
    - ICPs normally involved in staff sick callouts

# Methods – evaluate for surveillance bias

- Surveillance bias evaluated using a reference population
  - Nursing homes are a captive population
  - NV is commonplace in nursing homes
  - Served as a sentinel site for the amount of NV truly circulating in the community

# Results – NV as the etiology

- NV lab confirmed in 9/21 outbreaks (43%)
- NV GII was the most predominant genotype found
- NV suspected etiology in 12/21 (57%)
  - Symptoms, duration of illness, stool negative for bacteria, community illness

# Results – Staff vs. Patients

- Staff disproportionately affected
  - Longer duration: 21.8 days for staff, 9.7 days for patients
  - Higher number of NV: 1,832 staff and 274 patients affected
  - Staff affected in all outbreaks, patients only affected in only 13 of the 21 outbreaks studied
  - Staff initiated 17 of 21 outbreaks

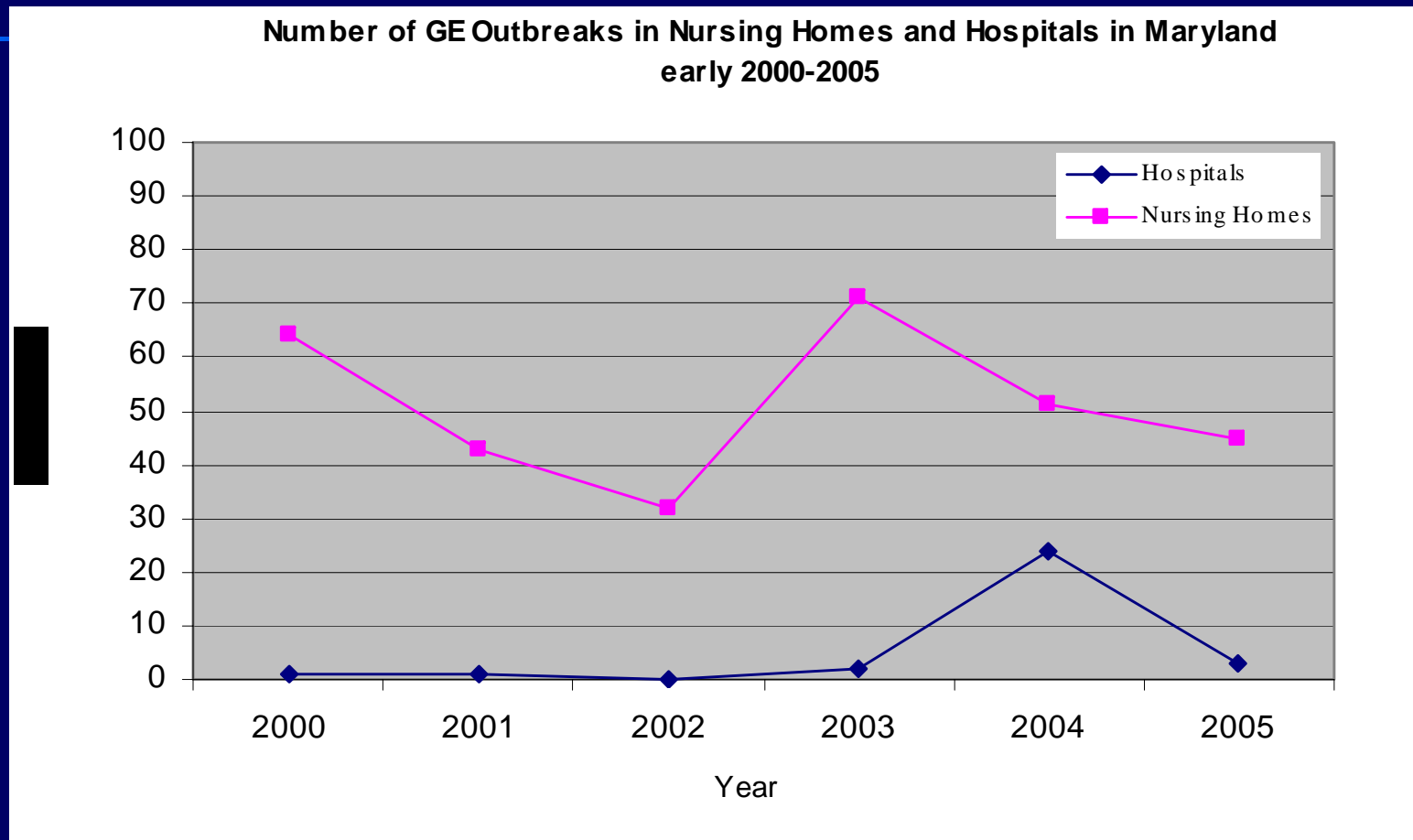
# Results – Statistical analysis

T-test results showed no statistical association

- the difference between the mean AR/duration did not differ among those who performed the infection control practice vs. those who did not

Predictor	Mean Attack Rate	Mean Outbreak Duration
Recommended cleaning	$p = 0.57$	$p = 0.69$
72 hour Staff Exclusion	$p = 0.36$	$p = 0.50$
Staff leave	$p = 0.51$	$p = 0.08$
ICP Normally aware of staff illness	$p = 0.81$	$p = 0.49$
Additional outbreak guidelines	$p = 0.80$	$p = 0.49$

# Results – Any surveillance bias?



- Nursing home NV decreased while hospital NV increased between 2003 & 2004
- Surveillance bias seems to have played a role

# Conclusions – what explains these outbreaks?

- Sensitive case definition
  - Staff may have been exposed to NV outside the hospital, yet were counted as a hospital case
- Surveillance bias
  - Nursing home NV decreased
- Introduction of a more virulent NV G114 strain into the community

# Conclusions – limitations of the study

- Data collected for public health practice
- Missing data
- Very small sample size (n=21 outbreaks)
- Collected data retrospectively from ICPs
- Data collected on outbreak level, not individual level
- No control group (e.g. hospitals with no outbreak during early 2004)

# Implications for practice

- NV is an emerging infection
  - Increasing disease
  - More virulent strains presenting
- Staff can be disproportionately affected (literature reflects this)
- Clarification can be sought relating to this outbreak
  - Compare NV GII in these outbreaks to the more virulent NV GII/4 seen elsewhere in the state

# Acknowledgements

- Special thanks for support throughout this project go to:
  - Leslie Edwards, MHS
  - Kirsten Larson, MPH
  - Dipti Shah, MPH
  - Biostatistics TAs at Johns Hopkins: Katie Ziegler and Kenny Shum
  - All the staff at the LHDs and area ICPs for providing data

Questions?