Quantifying the Uptake of Wireless Phone Use in CT, 2000-2014; Impact on Random-Digit-Dial Survey Methodology

Camille Pottinger, Paula Clogher, James Meek

Yale School of Public Health, CT Emerging Infections Program

EIP FoodNet Sites

- FoodNet (Foodborne Disease Active Surveillance Network) is the principal foodborne disease component of the EIP
- Relies on active laboratory based surveillance to identify foodborne illness cases in10 states including CT

California, Colorado, **Connecticut (Yale Emerging Infections Program)**
Georgia, Maryland, Minnesota, New Mexico, New York, Oregon and Tennessee

Phone Usage Validation Study

- For the past several decades, random digit dialing (RDD) telephone sampling of households with landline telephones has provided a cost-efficient and statistically sound method for conducting surveys of the US population[1].
- However, as the percentage of cell-phone only households continues to grow, the validity of the basic RDD landline sampling model used by most survey organizations has become open to question[1].
- A systematic review of 30 published articles with response rates ranging from ~30 to 85% found that bias due to underrepresentation from landline substitution contributed the greatest magnitude in survey error.

Different Groups Disproportionately Represented in Research Studies

- Legislation and changes in cellular phone ownership patterns have created distinct demographic groups who are more difficult to reach by standard RDD techniques[3].
- A 2012 national survey of households found that a majority (60.1%) of persons aged 25–29 years used a cell phone exclusively, while one tenth (10.5%) of adults aged 65 years or older did[2].
- In addition to the disproportionality of younger adults selected for surveillance studies, both Latinos and African Americans have traditionally been underrepresented in health research.

Gap in Literature/Rationale of Study

- Data on wireless usage based on estimates imputed from Surveys (National Health Interview Survey, Pew Research Center) which may not reflect actual usage, especially in population subgroups (age, Race/Ethnicity).
- There are limited data on the effectiveness of various recruitment strategies in these groups observed in previous case-control studies conducted in primarily White populations[5].
- Understanding the impact that wireless usage has on the ability to accurately sample using RDD methods, particularly among young adults or other populations with high cellular phone coverage rates is of important for public health surveillance and research.

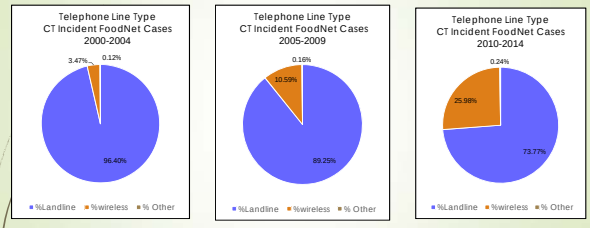
Objective:

- The purpose of this study was to quantify the uptake of wireless phone use among FoodNet cases in Connecticut over time and to evaluate the impact of wireless phone usage on random digit dialing (RDD) survey methodology

Methods:

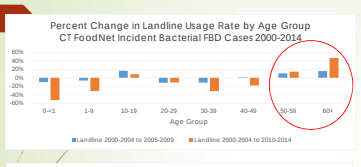
- Connecticut phone line data was obtained from the North American Local Exchange NPA NXX Database, NALENND™ which provides the line type (e.g., landline, wireless) of a phone number.
- The data was complied and merged with Connecticut FoodNet surveillance data using SAS.
- The analysis was restricted to incident foodborne illness cases that occurred from 2000-2014 and cases were grouped into 3-five year blocks (2000-2004, 2005-2009, 2010-2014)for comparison.
- Proportions and rates were calculated to describe the distribution of landline and wireless phone usage among FoodNet cases by demographic characteristics (age, race/ethnicity) and FoodNet pathogen.

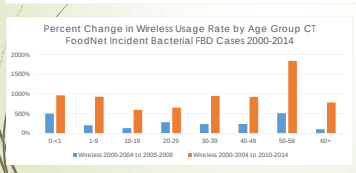
Results



Overall among CT FoodNet Cases, wireless phone usage has increased more than six fold (649 %) from 2000-2014 while landline usage has decreased by 23.5 % for the same time period.

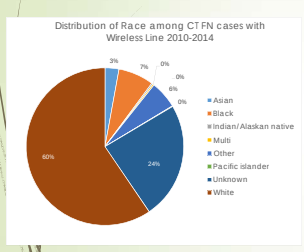
Results

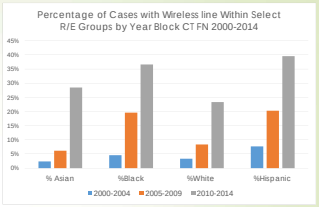




- A decrease in landline usage was seen in all age groups except for those 50+
  - Greatest change in landline usage rate over time was seen the 0-<1 age group, 5 fold decrease
- Wireless usage uptake was seen in all age groups.
  - Highest rate of wireless usage was seen in the 0-<1 age group at 30.5%
  - Greatest change in wireless usage rate over time seen in the 50-59 age group, 18 fold increase

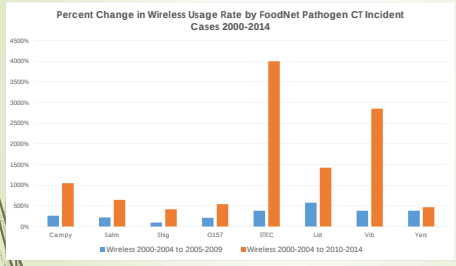
Results





Although the greatest of proportion of CT FoodNet cases with wireless lines are White Non-Hispanic, the proportion of cases with wireless lines among Hispanic, Black and Asian groups is growing faster overtime.

Results



- The rate of wireless usage among CT FoodNet cases differs dramatically by pathogen

Conclusions

- Change in uptake of wireless phone usage among CT FoodNet cases occurred across all age brackets and racial-ethnic groups over a 15 year period. However, substitution of landline phones for wireless devices is not occurring at the same rate for all groups.
- The proportion of wireless phone users is growing more rapidly among 50-59 year-olds, Hispanic and Non-White groups while traditional landline usage is decreasing among children and young adults.
- Use of landline phones for control recruitment in CT may lead to greater bias in results due to increased underrepresentation of the young and minority subgroups with no landline.
- Additionally the observation that the rate of wireless usage varied dramatically by FoodNet pathogen suggests that wireless usage may be linked to behaviors or characteristics specific to exposure which may further contribute to confounding.

Acknowledgements

- CDC FoodNet
- CT Department of Public Health

References

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