Infection Prevention in Nursing Homes and Palliative Care

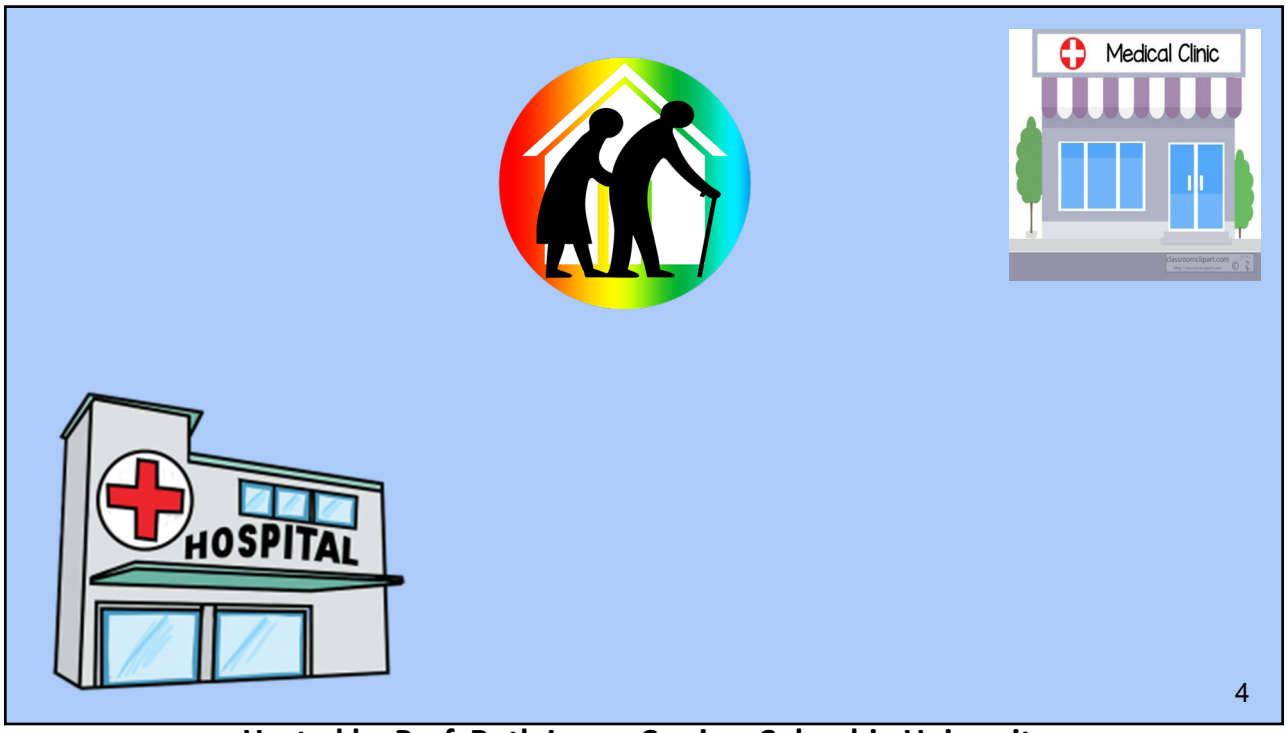
Pat Stone, PhD, RN, FAAN
Columbia University, Center for Health Policy
ps2024@cumc.Columbia.edu

Hosted by Prof. Ruth Lynne Carrico
Columbia University

www.webbertraining.com March 8, 2018

2


HOSPITAL
3


Medical Clinic
HOSPITAL
4


NURSING HOME


Medical Clinic


HOSPITAL

5


NURSING HOME


Medical Clinic


HOSPITAL

6

Today's Discussion

1. Background/context of nursing homes (NH) and infection prevention in the US
2. Prevention of Nosocomial Infections and Cost-Effectiveness in Nursing Homes (PNICE-NH)
   1. Five analyses
3. Next steps
   1. Integration of Infection Management and Palliative Care
4. Concluding Remarks

7

Prevention of Nosocomial Infections and Cost-Effectiveness in Nursing Homes (PNICE-NH)

R01 NR013687, Stone PI

8

Growing Elderly Living in Nursing Homes (NHs)

Approximately 1.4 million residents in 15,700 NHs
85% are ≥ 65 years

Americans aged ≥ 65 years will ↑ from 47.7 million in 2015 to 83.7 million in 2050

NH residents are becoming more diverse
This may be due to increased options for some

These residents are vulnerable[ii]
22% of NH residents experienced adverse events, 59% were preventable

[i]Vital Health Stat. 2013
[ii]DHHS, OEI-06-00370, 2014

9

Infections in NHs

765,000 to 2.8 million healthcare-associated infections (HAIs) annually[i]

- Most estimates are old and based on small sample sizes

HAIs are the most common reason of resident transfer to acute care and 30-day readmission and often these admissions come at the end of life[ii]

[i]Strausbaugh LJ, Joseph CL, ICHE, 2000; Koch AM et al, JHI, 2009; Dwyer et al JAGS 2013
[ii]Koch AM, JHI, 2009

10

Antibiotic Usage and MDROs in NHs

Antibiotics account for 40% of all medications administered
Between 50-80% of residents receive antibiotics at least once a year

Antibiotics are often initiated in the absence of clinical evidence of a bacterial infection

Older persons are susceptible to adverse side effects due to altered pharmacokinetics, polypharmacy, dosing errors and increased risk of *Clostridium difficile*

In a systematic review, we found up to 63% of residents were infected with a gram negative MDRO

In 35 NHs in Boston, 67% of advanced dementia patients in a NH were colonized or infected with MDRO

11

Aim 1

Estimate trends in infections in NH residents, 2006 – 2013 and a point prevalence of infections in NH residents in 2013

Herzig CTA, Dick AW, Sorbero M, Pogorzelska-Maziarz M, Cohen CC, Larson EL, Stone PW (2017) Infection Trends in United States Nursing Homes, 2006 – 2013. *JAMDA*. 2017

12

Minimum Data Set (MDS)

Clinical assessments performed on all NH residents
- Upon admission, at least quarterly and with significant change in status

Infection data have a "look back" period

Revised October 2010 (MDS 3.0)

13

Revised MDS: Infections

MDS 2.0 (2006-9/2010)	MDS 3.0 (10/2010-Present)
• UTI	• UTI
• Pneumonia	• Pneumonia
• MDRO	• MDRO
• Wound infection	• Wound infection
• Viral hepatitis	• Viral hepatitis
• Septicemia	• Septicemia
• Tuberculosis	• Tuberculosis
• *C. difficile*	• ~~*C. difficile*~~
• Conjunctivitis	• ~~Conjunctivitis~~
• HIV	• ~~HIV~~
• Respiratory infection*	• ~~Respiratory infection*~~
• Sexually transmitted diseases	• ~~Sexually transmitted diseases~~

*Other than pneumonia

14

Sample

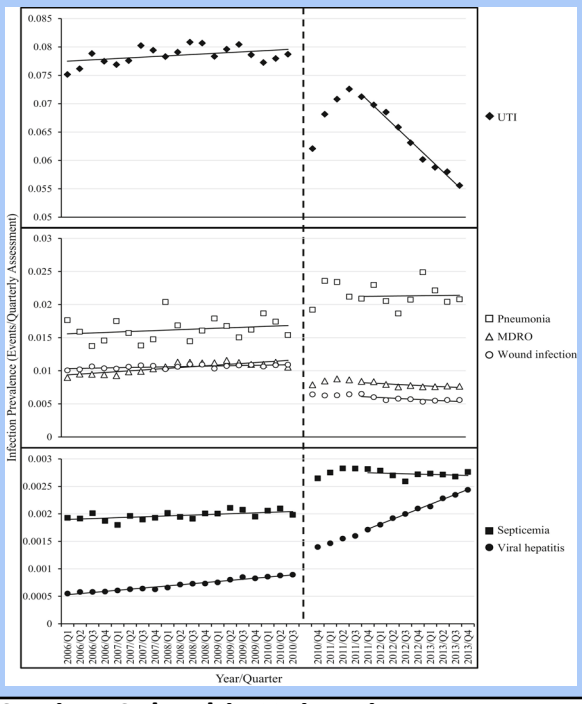
NH residents with a quarterly or annual MDS assessment in 2006 – 2013
- 30,366,807 assessments
- 15,000 NHs

15

Trends in Infection Prevalence

2006 – 2010 (MDS 2.0)
- Prevalence of all infection types **increased** (p-values <.01)

2011 – 2013 (MDS 3.0)
- Prevalence of UTI, MDRO, and wound infections **decreased** (p-values <.0001)
- Prevalence of viral hepatitis **increased** (p-value <0.0001)



16

Estimated Number of Infections in US Nursing Homes, 2013

	Count of infections	
Infection type	**Assuming 1 week duration**	**Assuming 1 month duration**
UTI	660,553	660,553
Pneumonia	1,071,603	247,293
MDRO	394,131	90,953
Wound infection	287,203	66,278
Septicemia	142,314	32,842
Viral hepatitis	125,523	28,967
Total	**2,681,327**	**1,126,886**

17

Aim 2

Obtain a national perspective of infection prevention and control programs in NHs using mixed methods

18

Qualitative Methods

Purposively sampled 10 NHs across the country

Recruited 6 to 8 employees

Semi structured interviews were audio taped

Directive content analysis conducted to identify themes

Stone, P.W., Herzig, C.T., Pogorzelska-Maziarz, M., Carter, E., Bjarnadottir, R.I., Semeraro, P.K., Cohen, C.C., Travers, J., Schweon, S. (2015). Understanding infection prevention and control in nursing homes: A qualitative study. Geriatric Nursing. doi: 10.1016/j.gerinurse.2015.02.023.

19

Results

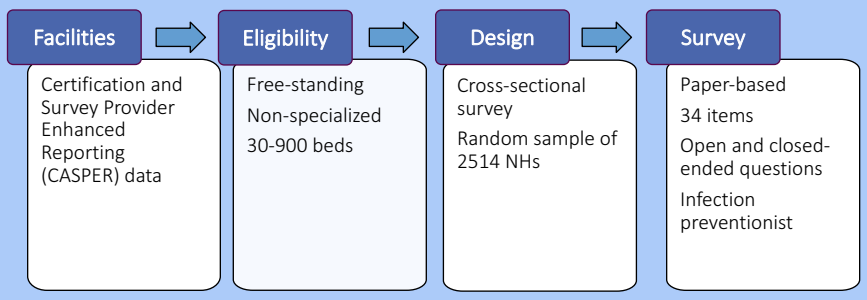
73 interviews including administrators, infection preventionists, staff nurses, aids, MDS coordinators and environmental services

5 themes

- Resident needs: with tension between the facility being a person's home and the need for infection prevention and control
- Roles and training: multiple responsibilities of staff and lack of formal infection prevention and control training
- Using infection data: while there was variations in surveillance methods/definitions, data were used to improve care
- External resources: A need for external information and support
- Focus on hand hygiene: All NHs focused on hand hygiene, however monitoring compliance was often informal

20

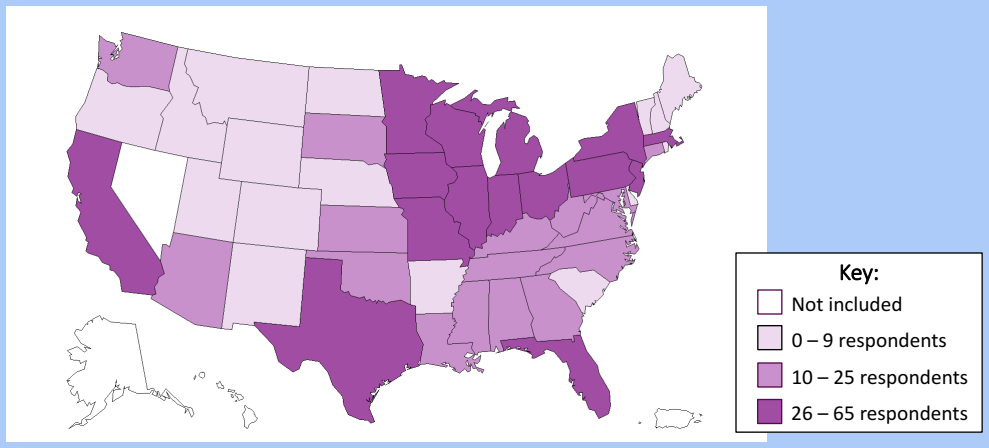
National Survey of NH Infection Control Programs



Herzig CTA, Stone PW, Castle N, Pogorzelska-Maziarz M, Larson EL (2016) Infection Prevention and Control Programs in US Nursing Homes: Results of a National Survey. *JAMDA*. 17(1):85-89.

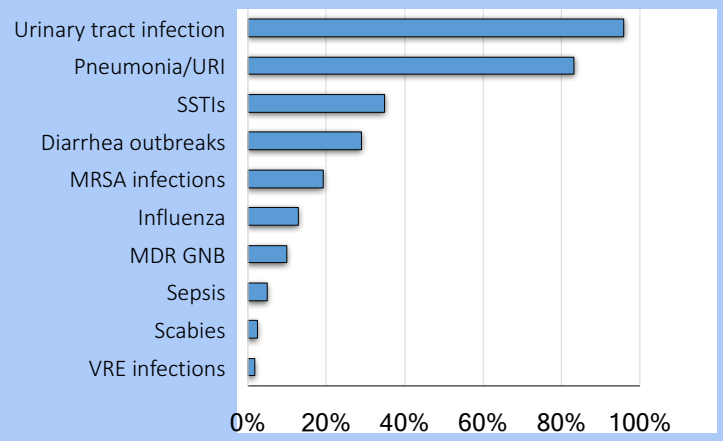
21

Geographic Distribution of NHs (n=990)



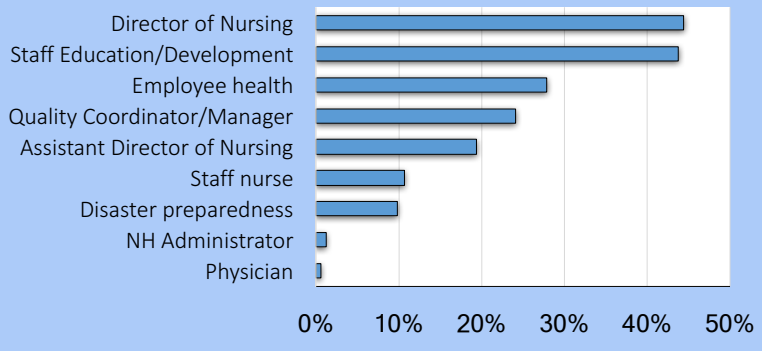
22

Percent of NHs that ranked each infection as one of three top challenges



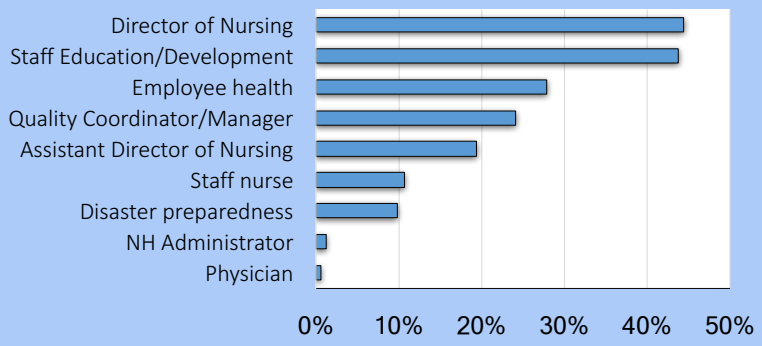
23

Those in charge of infection prevention wore multiple hats



24

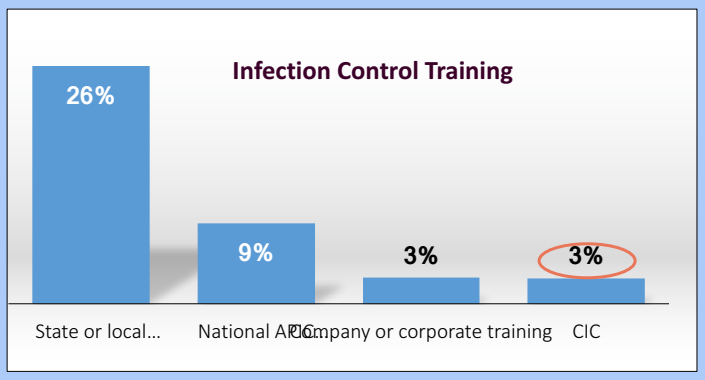
Those in charge of infection prevention wore multiple hats



29% of their time on infection control-related activities

25

Only *39%* of respondents had received any specific infection control training or certification



26

There was substantial variation in policies related to UTI prevention

Policies/programs for UTI prevention	%
Hydration protocols	80
Use of portable bladder ultrasound scanner	22
For men, use of condom catheters	7
For mobile residents, leg bags for daytime use	65
Specimen collection prior to initiating antimicrobial therapy	59
For residents with leg bags, leg bag cleaning	44
Nurse-initiated urinary catheter discontinuation	33
Urinary catheter reminder or stop-orders	22

Policies NOT specific to residents with indwelling catheters

On average, facilities had 1.1 of these 3 policies (SD=0.6)

Policies specific to residents with indwelling catheters

On average, facilities had 2.2 of these 5 policies (SD=1.4)

27

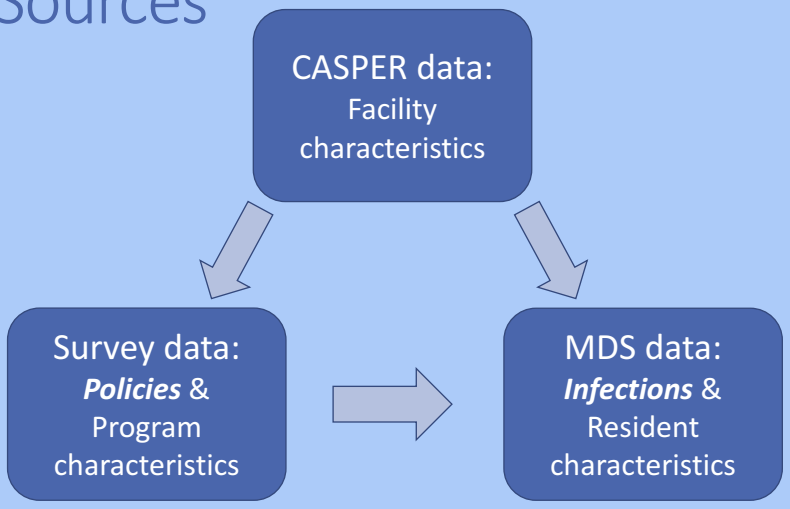
Aim 3

Evaluate relationships between the adoption of UTI policies and the occurrence of UTI

- With and without indwelling urinary catheters

28

Data Sources



29

Prevalence of UTI among NH Resident Assessments in 2013

n=273,125 assessments:

14,809 (5.4%) UTI

UTI among resident assessments WITHOUT indwelling urinary catheters (n=260,920 assessments):

12,628 (4.8%)

UTI among resident assessments WITH indwelling urinary catheters (n=12,192 assessments):

2,181 (17.9%)

30

Associations between UTI catheter prevention policies and UTI

	All resident assessments		Resident assessments WITHOUT indwelling catheters		Resident assessments WITH indwelling catheters	
	OR	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
For residents with leg bags, leg bag cleaning	0.93	0.83, 1.04	0.94	0.84, 1.06	0.81	0.67, 0.97

Note: All models adjusted for: resident age, sex, race/ethnicity, cognitive function, functional status, existing conditions; facility size, payer mix, staffing levels, ownership, location, infection preventionist training

31

Associations between UTI prevention policies NOT specific to residents with an indwelling urinary catheter and UTI

	All resident assessments		Resident assessments WITHOUT indwelling catheters		Resident assessments WITH indwelling catheters	
Number of policies (ref=no policies)	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
1 policy	0.95	0.84, 1.09	0.96	0.84, 1.10	0.93	0.75, 1.16
2 policies	0.90	0.77, 1.06	0.91	0.77, 1.07	0.86	0.67, 1.12
All 3 policies	0.73	0.54, 0.99	0.69	0.50, 0.95	1.08	0.64, 1.84

Note: All models adjusted for: resident age, sex, race/ethnicity, cognitive function, functional status, existing conditions; facility size, payer mix, staffing levels, ownership, location, infection preventionist training

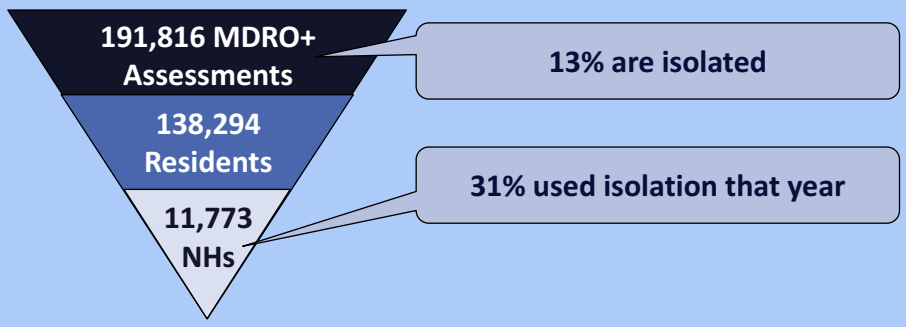
32

Aim 4

Examine Isolation Use in MDRO+ Residents

33

Results: Rate of Isolation Use



- Isolation use for MDRO is infrequent
- Majority of NHs do not use isolation for MDRO
  - 69% did not use isolation at all

34

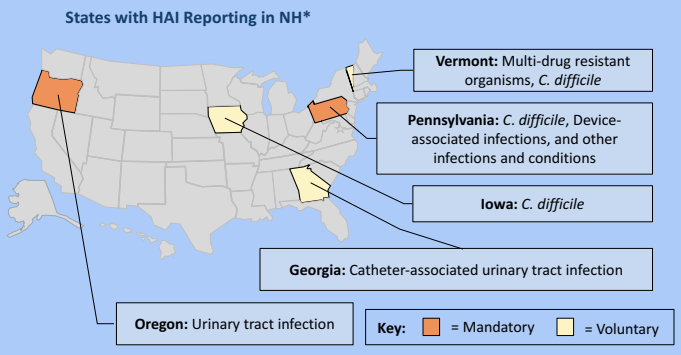
Aim 5

Examine associations between state HAI reporting efforts in NHs and NHs citations for deficiencies

Cohen CC, Engberg J, Herzig CT, Dick AW, **Stone PW**. Nursing Homes in States with Infection Control Training or Infection Reporting Have Reduced Infection Control Deficiency Citations. Infect Control Hosp Epidemiol. 2015;36(12): 1475-6. PMCID: PMC4658225.

35

Few States Have Mandatory or Voluntary HAI Reporting in NHs



**Note: Data were obtained by calling state HAI coordinators when state laws and forms were particularly difficult to discern*

36

NH Statements of Deficiencies (F-tags)

2012-2013 Certification and Survey Provider Enhanced Reporting (CASPER) data[i]

- 37.6% of NHs receive infection control deficiency citation
- 64.3% of NHs receive quality of care deficiency citation

37

NH Statements of Deficiencies (F-tags)

2012-2013 Certification and Survey Provider Enhanced Reporting (CASPER) data[i]

- 37.6% of NHs receive infection control deficiency citation
- 64.3% of NHs receive quality of care deficiency citation

NHs in states with mandatory or voluntary HAI reporting were less likely to receive[i]

- Infection control citation (**OR: 0.61; 95% CI 0.49, 0.75**)
- Quality care citation (**OR: 0.75, 95% CI: 0.55, 0.95**)

38

Conclusions about NHs

- Some evidence that state department of health policies/investment help
- MDS data are useful for identifying infection trends and isolation use
- Infections are a major and persistent problem in NHs
- Infection preventionists in NHs have little training
- Wide variation in infection prevention policies and practices in NHs across the US
- Evidence that NHs with more UTI prevention policies had lower prevalence of UTI
- Isolation is not being used consistently

39

Conclusions about NHs

- Some evidence that state department of health policies/investment help
- MDS data are useful for identifying infection trends and isolation use
- Infections are a major and persistent problem in NHs
- Infection preventionists in NHs have little training
- Wide variation in infection prevention policies and practices in NHs across the US
- Evidence that NHs with more UTI prevention policies had lower prevalence of UTI
- Isolation is not being used consistently

MORE NEEDS TO BE DONE!

40

Selected USA Federal Efforts

United States Department of Health and Human Services

42 CFR RULE (§483.80) UPDATES NH INFECTION PREVENTION AND CONTROL PROGRAMS
- System for preventing, identifying, reporting, investigating and controlling infections
- Antibiotic stewardship program
- Designated IP with specialized training
- IP participates on quality assurance committee

SURVEILLANCE CDC's NHSN Long-term care module

NATIONAL ACTION PLAN Reducing HAIs In Long-term care

NATIONAL ACTION PLAN Combating Antibiotic-Resistant Bacteria

NATIONAL ACTION PLAN Improvement of NH Quality

CMS *C.difficile* INITITIAVE Learning Collaborative

2012 2013 2014 2015 2016 2017

41

Closing Thoughts

NHs and HHC have less infection prevention resources

Infections and HAI are problematic in the community

Patients and visitors live in the community and infection prevention is a regional issue.

To decrease the problem of infections in the hospital, we also need to pay attention to the community we are serving

42

Infection Prevention in Home Health Care (InHOME)

R01 016865

Multiple PIs: Shang and Stone

43

The Study of Infection Management and Palliative Care at End-of-Life (SIMP-EL)

- Describe the integration of infection management and palliative care (re-**survey**)
- Examine factors associated with antibiotic use in NH residents at End-of-Life (Medicare claims data including Part D, survey, county level data)
- Examine factors associated with hospital transfer due to infections at End-of-Life (Medicare claims, MDS, survey, other data)

44

Thanks to a fabulous interdisciplinary team!

45

Questions, comments?

ps2024@cumc.Columbia.edu

46

Infection Prevention in Nursing Homes and Palliative Care
Prof. Pat Stone, Columbia University, Center for Health Policy
A Webber Training Teleclass

Hosted by Prof. Ruth Lynne Carrico, Columbia University
www.webbertraining.com