Stopping URIs and Flu in the Family: The STUFFY Trial
Dr. Elaine Larson, Columbia University School of Medicine
A Webber Training Teleclass

Stopping URIs and Flu in the Family: The STUFFY Trial

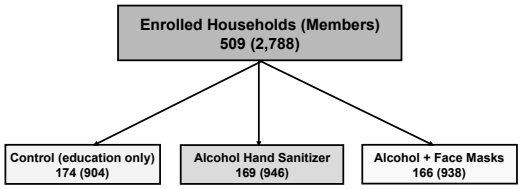
Dr. Elaine Larson
Columbia University School of Nursing

Hosted by:
Dr. Lynne Sehulster
Centers for Disease Control & Prevention

CDC

Columbia University
Mailman School of Public Health

Enrolled Households



Household Demographics

Characteristic	Educational Group	Sanitizer Group	Sanitizer + Mask Group	p-value*
Household size				
3 members	10.9% (19/174)	13.0% (22/169)	13.9% (23/166)	0.83
4-5 members	51.1% (89/174)	46.2% (78/169)	45.8% (76/166)	
>5 members	37.9% (66/174)	40.8% (69/169)	40.4% (67/166)	
Demographics of main responders				
Age <40 years	83.3%(145/174)	82.2% (139/169)	82.5% (137/166)	0.96
Education ≤ high school	46.0% (80/174)	43.2% (73/169)	38.0% (63/166)	0.32
Born outside the U.S.	90.2% (157/174)	90.5% (153/169)	92.8% (154/166)	0.67

*chi-square test

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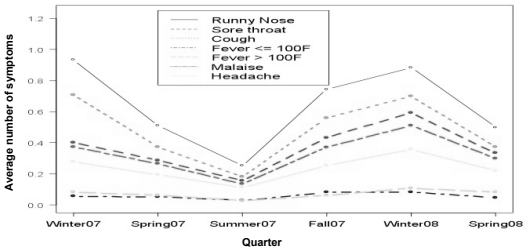
Average Number of Symptoms/ Individual/Quarter



•Households with at least one symptom reported: 83.3% (424/509)

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URI Symptoms

Members with no symptoms: 48.6% (1,355/2,788)

Members with no symptoms by intervention group:

Education Group	**49.4% (447/904)**	**p-value <0.01***
Sanitizer Group	**57.6% (545/946)**	
Sanitizer + Mask Group	**38.7% (363/938)**	

*chi-square test

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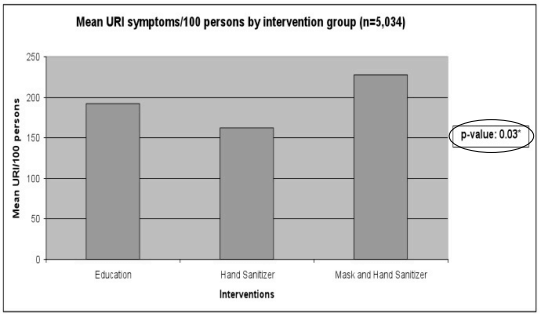
URI Symptoms



*ANOVA

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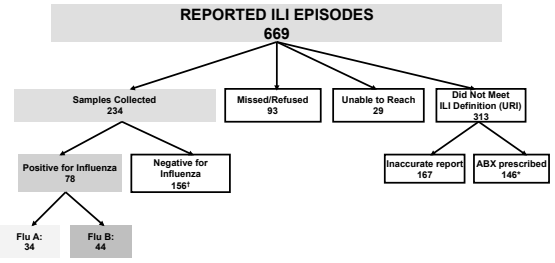
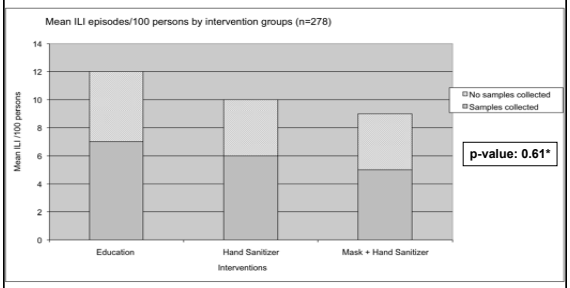
Influenza-like Illness (ILI)



† Among the 156 negatives for influenza, there were seven RSV, one paraflu type 1, three paraflu type 2, five paraflu type 3, eleven enterovirus, ten rhinovirus, six adenovirus and five human metapneumo-virus.

*46.6% were diagnosed to have a bacterial infection and prescribed an antibiotic

Influenza-like Illness (ILI)



*ANOVA

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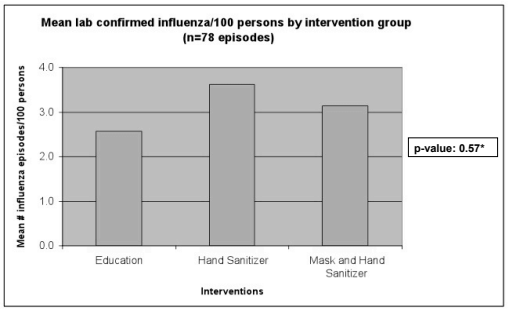
Lab Confirmed Influenza



*ANOVA

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Multivariate Analyses

- Poisson GEE (Generalized estimating equation) applied to URI and ILI outcomes
- Logistic GEE applied to influenza outcomes
- Covariates adjusted:
  - Gender
  - Age
  - Occupation
  - Education level
  - Place of birth (in/out of U.S.)
  - Hours spent outside of home
  - Vaccination status
  - Respiratory illnesses (e.g. asthma, COPD)
  - Number of children in household
  - Compliance with symptom reporting
  - Frequency of hand washing
  - Crowding index

Results

- Individuals born in the U.S. had ~1.5 more URI episodes than those born outside the U.S. (mean: 2.3 and 1.4 episodes/person, p=0.004)
- Younger individuals had higher rates of URI (p<0.001)
- Individuals with respiratory illness had 1.4 times more URI episodes than those without (2.5 and 1.8 episodes/ person, p=0.009)

Results

- Men had significantly fewer URI and ILI than women
- The odds of getting influenza were 5.16 times higher for college graduates as compared to those with less than high school education
- The odds of getting influenza were 2.56 times higher for homemakers and those unemployed compared to other professions
- No significant differences among the three groups

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Secondary Cases of Flu/ILI/URI

INTERVENTION GROUP	Relative Risk (95% Confidence Limits)	P VALUE
Education Group	Ref	p-value: 0.02*
Hand Sanitizer Group	1.01 (.85, 1.21)	
Hand Sanitizer + Mask Group	0.82 (.7, .97)	
Total	0.65 (2,130/3,274)	

*Regression controlling for gender, age group, whether or not born in the U.S., number of hours/week spent outside of the home, whether or not he/she had a chronic respiratory illness such as asthma, and influenza vaccination status, household crowding

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Secondary Cases of Any URI

AGE RANGE	Secondary Cases/ Index Case	P VALUE
0-5 years old	0.57 (910/1,591)	p<0.0001
6-12 years old	0.86 (302/351)	
13+ years old	0.69 (913/1,324)	

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Secondary Cases of Flu/ILI/URI: Other Predictors

Factor	Relative Risk (95% CI)
• Age of index case, 0-5 yrs, compared to adult	• .81 (.70, .94)
• Caretaker education <high school, compared to college graduate	• .79 (.61, 1.03)

Crowding

- Crowding Index: Ratio of the number of people in the household divided by the number of rooms
- Relative Risk: .80 (.72, .89), p< .0001
- Corresponds to the decrease in odds of a secondary case when crowding is increased by 1
- More crowding—fewer URIs!

Mask Usage for Confirmed ILIs and Flu (n=68 episodes)

•Episodes where masks were used: 55.9% (38/68)

•Mean number of masks used/day/episode (includes collected and self-reported): 2 masks

•Who is wearing the masks?

Frequency	Index Case	Contacts
Most or some of the time	27.9% (19)	25.0% (17)

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Reasons for Poor Masking

- Focus group and home visits with a subset (15 households) of the face mask group employing the "think aloud" technique
- No significant association between any of the demographic, attitudinal or knowledge variables measured and adherence to wearing masks

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Reasons for Poor Masking

- Mask group had higher risk perceptions about flu (means: 37.6 and 30.2, p<0.001) and perception of effectiveness of mask wearing (means: 7.8 and 7.3, p=0.043)
- Themes: difficulty for children to wear masks, social acceptability, comfort and fit, level of activity/ physical exertion and mask use, and perception of risk/need for mask.

Knowledge, Attitudes, and Practices

(Maximum score: 10)

	Educational Group	Sanitizer Group	Mask and Sanitizer Group
Pre	5.12	5.48	5.11
Post	5.75	7.24	6.40
Diff	0.63	1.76	1.29

Regression analysis comparing difference scores between groups (p<0.001)

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Antibiotics for Viral Symptoms

- 100 in-depth interviews
- 191 uses of antibiotics were reported.
- 45/191 (23.6%) were self-medicated.
- Self-medication was rare among children (97.6% of reported antibiotic use in participants under 18 was by prescription), but common among participants over 18 where 43/64 (67.2%) of antibiotic use was by self-medication.
- Non-US versions of antibiotics accounted for 25/191 (13.1%)

Sensitivity and Specificity of Rapid Tests

Test		Sens	Spec	PV+	PV-
QuickVue	Influenza A	0.48	1.00	1.00	0.89
(n=138)	Influenza B	0.22	0.99	0.89	0.78
	Influenza A+B	0.33	0.99	0.95	0.64
3M	Influenza A	0.28	0.96	0.58	0.86
(n=140)	Influenza B*	0.39	0.97	0.83	0.81
	Influenza A+B	0.33	0.92	0.77	0.64

* Two samples were positive for both influenza A and B, but lab confirmed it as influenza B

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Vaccination

- 66.6% among children <5 years, 55.9% among 5-17 years, 26.2% among 18-49 year, 45.7% among 50-64 year, and 35.0% among adults ≥ 65 years
- Major barrier: belief that influenza vaccination was unnecessary or ineffective

Predictors of Vaccination

- For children, younger age, having a chronic respiratory condition (e.g. asthma), and greater respondent knowledge of influenza
- For adults, female gender, older age, higher education, greater respondent knowledge of influenza, having been born in the U.S., and having a chronic respiratory condition

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New Findings

- Efficacy of soap and water and alcohol-based hand-rub preparations against live H1N1 influenza virus on hands of human volunteers
- Marked antiviral activity for both by culture and PCR, but soap and water was superior (p<.001), although actual difference was only 1-100 virus copies/µl
- Grayson, et al. 2009; Clin Infec Dis 48:285-91.

Conclusions

- No significant difference between intervention groups in terms of numbers of URI, ILI and flu but secondary attack rate lower in mask group
- Increased KAP scores
- Increased vaccination among household members
- Low compliance with mask wearing
- NPIs will likely continue to be an important strategy to minimize flu; their efficacy and effectiveness should be further assessed
- Further evaluations of rapid influenza tests

Contributions to Knowledge

- Targeted education and increased hand hygiene in general were likely important interventions ('controls')
- Mask wearing difficult to enforce
- Screening tests of low sensitivity
- Sources of information vary by ethnic group
- Parents self-medicated with antibiotics for themselves, but not their children

Gaps/Next Steps

- Mask wearing during outbreaks—how frightened do people have to be?
- Effect of targeted education alone
- Factors associated with low sensitivity of rapid tests

Team Members

Left to right: Maria Alvarez-Cid, Maria Jose Gonzales, Jennifer Wong-McLoughlin, Elaine Larson, Angela Barrett, Yu-hui Ferng

Stephen S. Morse, PhD

Shuang Wang, PhD

The Next Few Teleclasses

25 Feb. 10	Influenza in the Hospital – Who Gets it From Whom Speaker: Dr. Alison McGeer, Mount Sinai Hospital, Toronto
4 Mar. 10	(Novice Teleclass) An Introduction to Infection Prevention and Control in Healthcare Speaker: Gail Bennett, ICP Associates Inc.
11 Mar. 10	(Novice Teleclass) MRSA Prevention Basics Speaker: Dr. Bill Jarvis, Jason & Jarvis Associates
18 Mar. 10	(Novice Teleclass) How to Prepare for CIC Certification Without Becoming Certifiable Speaker: Susan Cooper, Southeastern Ontario Infection Control Network
23 Mar. 10	(Free Teleclass) Voices of CHICA Speaker: Directors & Guests of the Community & Hospital Infection Control Association of Canada
25 Mar. 10	(Novice Teleclass) Infections in the Elderly Speaker: Christine Nutty, Infection Advice Inc.

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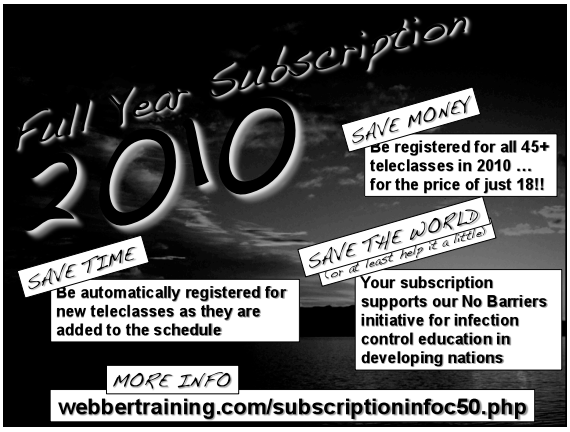

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