Creating Effective Academic Posters

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Expert Medical Writing, Multi-Media and Marketing

Creating Effective Academic Posters:
An Example-Based Webinar

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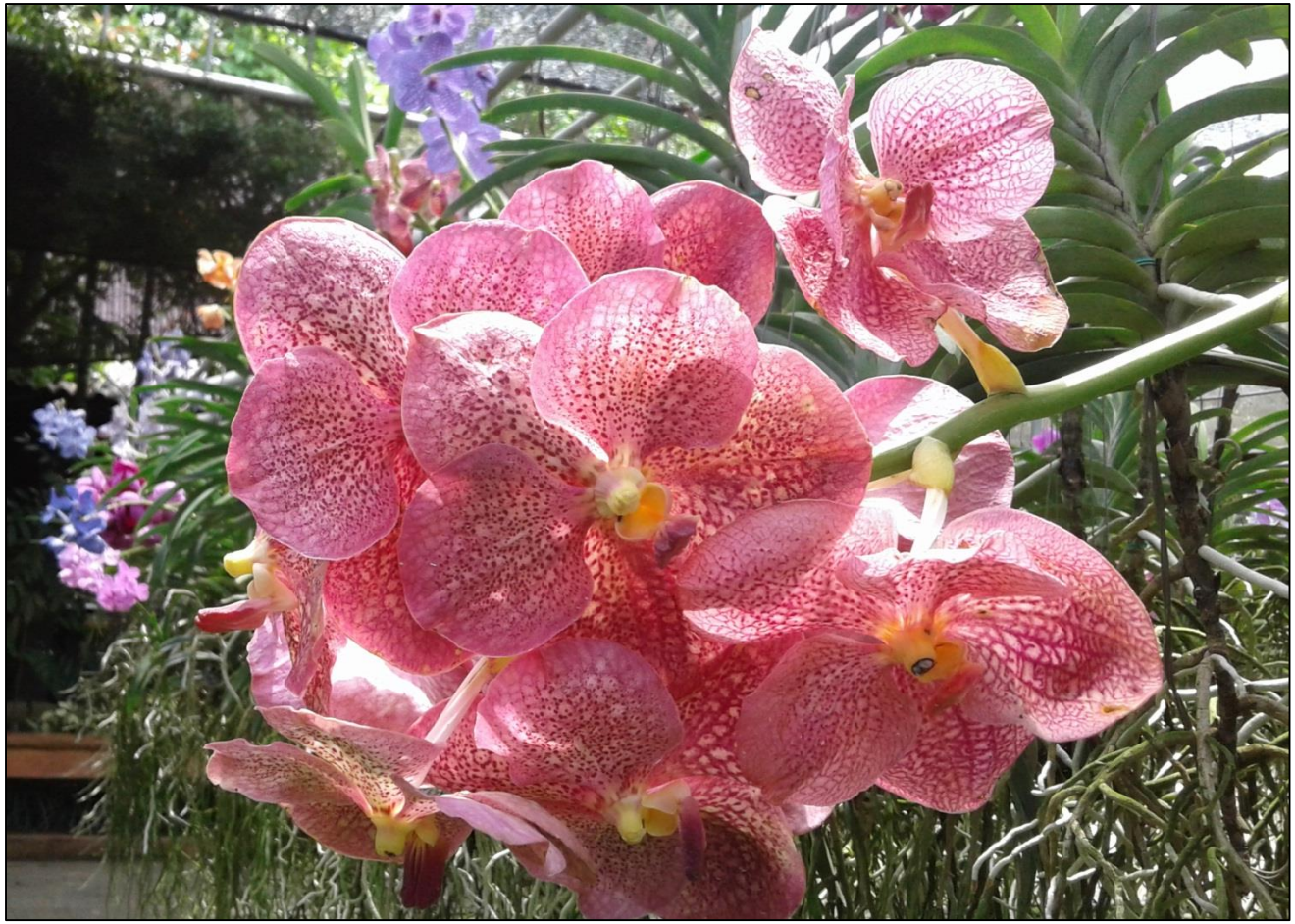
Picking Flower will be
Fined 2,000 Baht.

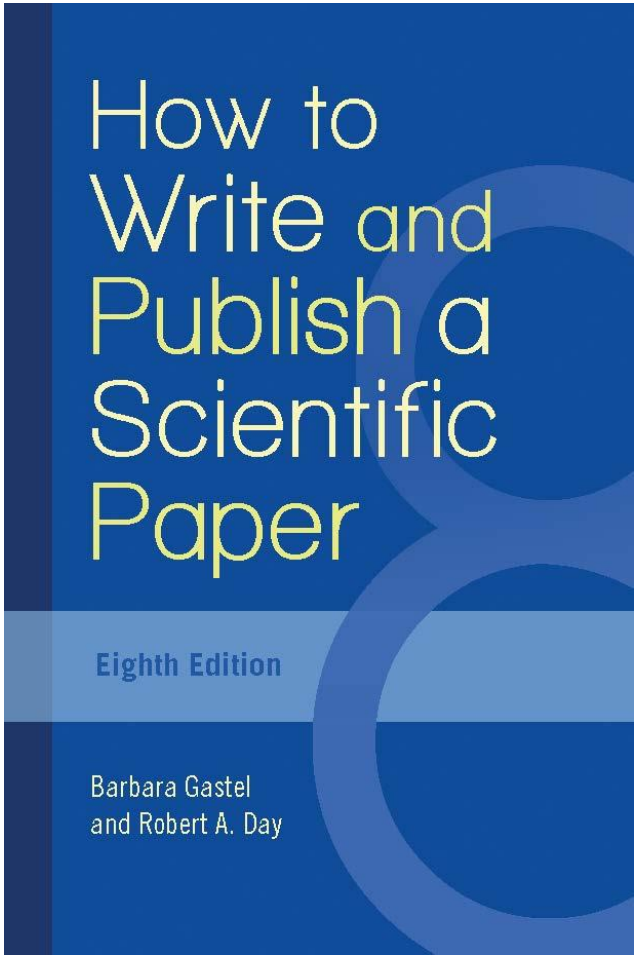
Overview

- Background
- Review: key points from “Posters That Pop”
- Discussion of some posters with CDC authors
  - Strengths
  - Suggestions
- Discussion of more such posters if time allows
- Some resources
- Questions and answers

Background



A Little About My Background



Some Aspects of My Background

- MD/MPH focusing on science communication
- Teacher of science writing, science editing, and related subjects
- Coordinator of science journalism MS program
- First author: newest edition of *How to Write and Publish a Scientific Paper*
- Past recipient of fellowship to evaluate EIS course
- It's good to be back!

Recap: Some Key Points from "Posters That Pop"

Some Key Points

- Keep the poster (and images in it) simple.
- Emphasize the visual.
- Beware of making text and images too small.
- Organize the poster logically.
- Include ample white space.
- Make the title large enough.
- Don’t write the title in all capital letters.

More Key Points

- In general, use graphs, not tables.
- Remember to label each image.
- Where feasible, use bulleted or numbered lists rather than paragraphs.
- If paragraphs are used, keep them short.
- Don’t right-justify.
- Include contact information.

Discussion of Some Posters

Discussion of Some Posters

- The posters for discussion
  - From the internet
  - Include CDC authors
- The procedure
  - Identify strengths (Please type in your points.)
  - Then make suggestions (Ditto.)

WHY SHOULD I GET SCREENED?

Addressing Common Misconceptions about Colorectal Cancer Screening

Cynthia A. Gelb[a], BSJ, Jennifer Chu[b], MPH, and Lauren Grella[b], MA

[a] Division of Cancer Prevention and Control, Centers for Disease Control and Prevention, Atlanta, GA
[b] Ogilvy Washington, Washington, DC

BACKGROUND

Of cancers affecting both men and women, colorectal cancer (CRC) is the second leading cancer killer in the United States, even though it is largely preventable. Screening, beginning at age 50, helps prevent CRC or find it early, when treatment works best. Still, approximately 40% of Americans have not been screened as recommended. The Centers for Disease Control and Prevention's (CDC) *Screen for Life: National Colorectal Cancer Action Campaign* (SFL) educates men and women about the importance of CRC screening. SFL creates and disseminates public service announcements (PSAs) and patient education materials, and works with state and tribal health departments to promote CRC screening.

RESEARCH

SFL material development is informed by substantial audience research. In 2010, SFL conducted focus groups in Philadelphia, Los Angeles, Chicago, Miami, and Charleston, to assess knowledge, attitudes, and behaviors related to CRC and screening, and to test PSA creative concepts. In total, 139 men and women participated in English-language/general population (GP) focus groups; 79 men and women participated in Spanish-language (SP) focus groups. Participants were either close to age 50, when screening is recommended to begin for those at average risk for the disease, or they were aged 50 – 75.

While most participants expressed awareness about CRC in general, and were familiar with colonoscopy as a screening test, they were less knowledgeable about other recommended screening options and who should be screened. Common reasons they stated for avoiding screening included:

- Having no symptoms
- Having no family history
- Believing they were too young for screening
- Being reluctant to have a colonoscopy because of the perceived invasiveness and discomfort associated with it

Concepts that clearly communicated facts about screening and directly addressed misconceptions were most appealing to focus groups participants, who also expressed appreciation for including racially and ethnically diverse people in the creative concepts.

The findings and conclusions in this poster are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

PSA DEVELOPMENT AND DISTRIBUTION

These findings led SFL to produce "No Excuses" ("No Hay Excusas" in Spanish) TV and print PSAs. They feature diverse men and women stating misconceptions and excuses for why they have not been screened, along with the facts correcting these misconceptions.

"...One thing that did pop in my mind that made me want to say, oh maybe I'd better go and get checked, is that the symptoms don't always show. That made me say, okay [I need to get screened]." (Los Angeles participant)

FACT: Colorectal cancer doesn't always cause symptoms, especially early on.

"I didn't know that most colorectal cancer occurred in people that didn't have a family history..." (Philadelphia participant)

FACT: Most colorectal cancers occur in people with no family history.

"The message is clear: have the exam done and it says there are different exams, which I only knew of one. Apparently there are others that are not as invasive...so interesting." (Miami participant)

FACT: There are several kinds of screening tests for colorectal cancer.

"Really I don't have any excuse. I am over 50 and I need to take responsibility for my health." (Chicago participant)

FACT: Screening is recommended for men and women beginning at age 50.

The "No Excuses" and "No Hay Excusas" TV PSAs were first distributed in March 2012. Postcards and posters adapted from the PSAs were made available through the SFL Web site. In December 2012, specially-adapted "No Excuses" and "No Hay Excusas" PSAs were distributed in targeted U.S. cities for display in airports, shopping malls, and transit stations, as well as on TV monitors in elevators in public buildings.

EVALUATION METHODS AND RESULTS

SFL TV PSAs are tracked by Nielsen, providing CDC with data on how often, when, and where the PSAs are broadcast; audience impressions (number of times PSAs are seen or heard); and donated ad value. Print PSAs are tracked using a clipping service, providing publication names, markets, impressions, and equivalent ad value.

As of May 31, 2013, "No Excuses" and "No Hay Excusas" PSAs in all media have generated more than 1.18 billion impressions worth $21 million in donated ad value.

CONCLUSIONS

Since SFL was launched in 1999, consumer knowledge and attitudes about CRC screening have shifted. Screening rates have increased significantly (from 45% of men and 41% of women screened according to guidelines in 2000, to approximately 63% in 2010). However, misconceptions about CRC and screening still exist. Addressing misconceptions in educational materials may encourage more people to be screened as recommended.

IMPLICATIONS FOR RESEARCH AND/OR PRACTICE

Misconceptions about colorectal cancer screening prevent many people from being screened according to guidelines. Recognizing these common misconceptions and addressing them in a direct manner can effectively promote appropriate screening for this highly preventable cancer.

www.cdc.gov/screenforlife

National Center for Chronic Disease Prevention and Health Promotion
Division of Cancer Prevention and Control

What are some strengths of this poster?

Some Strengths

- Engaging title
- Attractive, cohesive color scheme
- Use of color to differentiate types of text
- Logical organization
- Sufficient white space
- Not too much text; also, text broken up
- Relatively simple images
- Human interest (photos of people)
- Other

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What suggestions do you have?

Some Suggestions

- Consider using capital letters less.
- Perhaps provide contact information.
- Other

Comparative Effectiveness Research for Traditional versus Web-based Tobacco Cessation Interventions. Review of the Literature and Overview of the CDC Tobacco Cessation Study

B Momin,[1] A Neri,[1] L Zhang,[2] J Kahende,[2] H Hanson,[3] V Rabius,[3] J Duke,[3] A Malarcher,[2] S Stewart,[1] and L Seeff,[1]

[1]Centers for Disease Control and Prevention (CDC), National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP), Division of Cancer Prevention and Control, Comprehensive Cancer Control Branch; [2]CDC, NCCDPHP, Office on Smoking and Health; [3]Research Triangle Institute

Phone vs. Web Cessation: Use and Impact

	Telephone[1]	Web[2]
User population	*~449,000 accessed Quitlines in 2010*	*~80% 2010 US pop (250 million) use the internet 8 million people accessed cessation sites in 2005 Social media use ↑ 4x from 2005 → 2009*
Typical user	*~44 years old 57% Female 79% Caucasian*	*~38 years old 70% Female 90% Caucasian*
Long-term quit-success	*1-29% (tailored=better)*	*11-22% (tailored=better)*
Costs / quit	*$1,472 - $1,850*	*$291 - $1,278 (More $ = proactive)*

Any behavioral intervention ~ 15% Long-term quit-success

Tobacco Cessation Comparative Effectiveness Studies

- Civljack et al. Cochrane Collab. 2010
  - Meta-analysis of 20 studies; heterogeneous populations
  - Small # studies, very limited evidence
  - Some evidence that tailored > non-tailored
- An et al. Nic. Tob. Res. 2010
  - Observational; 1,706 in MN
  - Proactive contact, Nicotine Replacement Therapy (NRT)
  - Telephone > Web to achieve successful cessation
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  - Odds of quitting ↑ 56% / call vs. 14% / log-in
- Swan et al. Am. J. Prev. Med. 2010
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- Graham et al. Arch. Int. Med. 2011
  - RCT; 2,005 US Internet users
  - Proactive contact via internet search engines, NRT
  - Basic Internet = non-tailored/non-interactive
  - Enhanced = (Quitnet.com) tailored/interactive
  - 30-day quit success at 6 months (both results $P < 0.01$)
    - Enhanced Int. (8%) > Basic Internet (6%)
    - Enhanced Int. + Phone (15%) > Enhanced Int. (8%)

Summary

Studies to date are relatively small, may not be nationally representative, and may not fully evaluate current practices. Hence, CDC is undertaking a study to compare cessation methods, impact of promotion activities on Quitline call volume, and partnership practices between Comprehensive Cancer and Tobacco Control Programs.

Methods

Cessation Study (Telephone vs Web-based)

Questions

- Are there demographic differences between user populations?
- Are there differences in smoking and quitting behaviors?
- What are the predictors of successful quitting?
- Is there a difference in quitting success between interventions?

Population - 8,000 participants in 4 states (4,000 Telephone - 4,000 Web-based); Powered to find ~ 4% difference between arms
Data - Standardized National Quitline Data Warehouse 6-month follow-up surveys
Method - Quantitative analysis
Outcome - 30-day point prev. smoking abstinence at 6-month follow-up

Promotion Study

Questions

- What are the innovative promotional and educational activities?
- Who is exposed to online promotional ads?
- Characteristics of those reached via innovative vs. traditional media?
- How do ads affect awareness and cessation-seeking behavior?

Population - 28 states
Data - Paid and earned media coverage Q4 2010 to Q4 2012
Method - Quantitative analysis
Outcome - Quitline call volume

Partnership Study (State Comprehensive Cancer and Tobacco Control Programs)

Questions

- What partnership efforts currently exist?
- How does integration and other factors influence collaboration?
- What factors are associated with each level of collaboration?
- What key factors facilitate/hinder collaboration?

Population - 7 states
Data - In-depth interviews of staff from both programs and State Health Dept.; organizational charts
Method - Qualitative analysis

States enrolled in the Cessation component

States enrolled in the Promotion component

States enrolled in the Partnership component

Project Timeline

Study Project Period 7/2010 - 4/2013

Public Health Implications

- Overall
  - Population-based evidence of effective tobacco cessation methods in multiple states for use by comprehensive cancer control programs, other public health practitioners, and policy -makers
- Cessation component
  - Largest multi-state study to date, powered to detect small differences in cessation rates between modalities
- Promotion component
  - Determine efficacy of various media practices on Quitline call volume beyond seasonal variation and one-time campaigns.
- Partnership component
  - Assists Comprehensive Cancer and Tobacco Control Program directors with determination of best practices, issues-resolution strategies, and promotes better leveraging of resources.

Contact Information

Behnoosh Momin, MS, MPH
CDC Division of Cancer Prevention and Control
BMomin@cdc.gov
770-488-3112

Comprehensive Cancer Control
Collaborating to Conquer Cancer

National Center for Chronic Disease Prevention and Health Promotion
Division of Cancer Prevention and Control

E-mail: cdcinfo@cdc.gov Web: www.cdc.gov

CS232599

What are some strengths of this poster?

Some Strengths

- Logical organization
- Cohesive color scheme
- Use of bulleted lists rather than paragraphs
- Use of simple images
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- Other

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CS232599

What suggestions do you have?

Some Suggestions

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- In areas with colored background, make sure there's enough contrast with the text.
- To help clarify the structure, perhaps use less line spacing within blocks of text than between blocks of text.
- Other

Cost Comparison of Skin Versus Blood Testing for the Evaluation of Close Contacts to AFB Sputum Smear Positive TB Cases, District of Columbia, 2011-2013

Alexander, Shanica[1,2] Foster, Bethany[1,2] Nettles, Sabrina[1,2] Holt, Latrice[1,2] Person, Robert[2]

Centers for Disease Control and Prevention[1], District of Columbia Department of Health[2]

BANKGROUND

The evaluation of close contacts to infectious TB cases is the second priority in preventing and controlling tuberculosis in the United States. Despite the challenge of dwindling resources, the District of Columbia TB Control Program strives to implement innovative and evidence-based practices in the identification, evaluation and treatment of close contacts to infectious TB cases.

OBJECTIVE

To calculate and compare all costs associated with evaluating contacts to Acid-Fast Bacillus (AFB) sputum smear positive cases that were tested with a TST (7/31/11-7/31/12) compared to those tested with an IGRA (8/1/12-8/1/13).

CONTACT INFO
Shanica Alexander
ioms5@cdc.gov
(202) 698-4042

METHODS

The TB Control Clinic switched from tuberculin skin test (TST) screening of close contacts to interferon gamma release blood assay test (IGRA) screening on August 1, 2012. A retrospective analysis was done comparing costs pre- and post-change through contact investigation reviews, purchase order reviews and key informant interviews with TB Investigators, Nurse Case Managers and the Nurse Practitioner. Unit costs were created for each item and activity associated with the medical evaluation of a close contact. An Excel spreadsheet was created to collect the activity data fields and costs for all close contacts investigated by District of Columbia Department of Health.

Costs of Medical Evaluation Activities

Item	# of Units Needed	Cost
Chest X-ray	1	$82.00
Nurse Practitioner Hourly Rate	.33	$26.40
Standard Mileage Rt 2014	1	$.56
TST	1	$16.21
IGRA	1	$74.56

Cost to Perform a TST

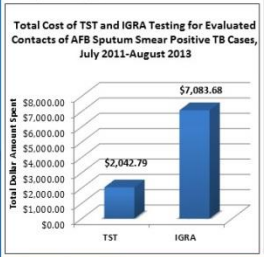
Item	Cost	# Units Per Package	# Units Needed for Test	Cost for Test
Vial of Tuberculin	$117.45	50	1	$2.79
Tuberculin Syringe	$69.19	100	1	$.69
Alcohol Wipes	$3.95	80	2	$.10
Gloves	$8.75	100	2	$.18
Sharps Container	$6.59	1	1	$6.59
Biohazard Bags	$11.90	50	1	$.24
TB Investigator Hourly Rate	$28.08	1	.2	$5.62
Total				*$16.21*

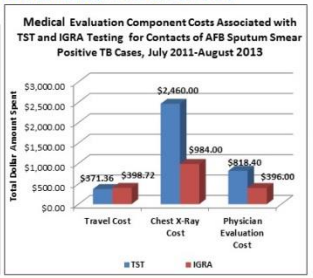
Cost to Perform an IGRA

Item	Cost	# Units Per Package	# Units Needed for Test	Cost for Test
T-Spot Lab Cost	$55.00	1	1	$55.00
Vacutainer Tube	$472.45	100	1	$4.72
Vacutainer Holder	$15.25	250	1	$.06
Vacutainer Butterfly Needles	$77.30	50	1	$1.55
Alcohol Wipes	$3.95	80	2	$.10
Tourniquet	$2.68	10	1	.27
Gauze Pads	$6.79	100	2	$.14
Band-Aids	$8.99	100	1	$.09
Gloves	$8.75	100	2	$.18
Sharps Container	$6.59	1	1	$6.59
Biohazard Bags	$11.90	50	1	$.24
TB Investigator Hourly Rate	$28.08	1	.2	$5.62
Total				*$74.56*

RESULTS

From 7/31/11-7/31/12, 13 AFB sputum smear positive patients were investigated and 126 TSTs were performed totaling $2,042.79 in cost. These screening tests led to 663.16 miles traveled, 30 chest x-rays and 31 medical examinations, with total costs of $371.36, $2460.00 and $818.40, respectively. From 8/1/12-8/1/13, 11 AFB sputum smear positive patients were investigated and 95 IGRAs were performed totaling $7,083.40 in cost. These screening tests led to 712 miles traveled, 12 chest x-rays and 15 medical examinations, with total costs of $398.72, $984.00 and $396.00, respectively.





CONCLUSION

Doing more with less has become a public health mantra – especially for TB control programs. For those programs still providing direct services, even small changes can lead to significant costs and benefits. Switching from TST to IGRA screening of close contacts of AFB sputum smear positive TB cases in Washington, DC significantly increased the overall cost (from $5,692.55 to $8862.12) but decreased by more than 50% the number of chest x-rays and medical evaluations performed. For integrated programs like ours, with a shared budget but a clinic predominantly run by volunteer physicians, the benefit of less provider contact ultimately outweighed the additional cost of the test.

National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention
Division of TB Elimination

What are some strengths of this poster?

Some Strengths

- Large enough type
- Cohesive color scheme
- Simple tables and figures
- Use of red to highlight main conclusions
- Inclusion of contact information
- Other

Cost Comparison of Skin Versus Blood Testing for the Evaluation of Close Contacts to AFB Sputum Smear Positive TB Cases, District of Columbia, 2011-2013

Alexander, Shanica[1,2] Foster, Bethany[1,2] Nettles, Sabrina[1,2] Holt, Latrice[1,2] Person, Robert[2]

Centers for Disease Control and Prevention[1], District of Columbia Department of Health[2]

BANKGROUND

The evaluation of close contacts to infectious TB cases is the second priority in preventing and controlling tuberculosis in the United States. Despite the challenge of dwindling resources, the District of Columbia TB Control Program strives to implement innovative and evidence-based practices in the identification, evaluation and treatment of close contacts to infectious TB cases.

OBJECTIVE

To calculate and compare all costs associated with evaluating contacts to Acid-Fast Bacillus (AFB) sputum smear positive cases that were tested with a TST (7/31/11-7/31/12) compared to those tested with an IGRA (8/1/12-8/1/13).

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METHODS

The TB Control Clinic switched from tuberculin skin test (TST) screening of close contacts to interferon gamma release blood assay test (IGRA) screening on August 1, 2012. A retrospective analysis was done comparing costs pre- and post-change through contact investigation reviews, purchase order reviews and key informant interviews with TB Investigators, Nurse Case Managers and the Nurse Practitioner. Unit costs were created for each item and activity associated with the medical evaluation of a close contact. An Excel spreadsheet was created to collect the activity data fields and costs for all close contacts investigated by District of Columbia Department of Health.

Cost to Perform a TST

Item	Cost	# Units Per Package	# Units Needed for Test	Cost for Test
Vial of Tuberculin	$117.45	50	1	$2.79
Tuberculin Syringe	$69.19	100	1	$.69
Alcohol Wipes	$3.95	80	2	$.10
Gloves	$8.75	100	2	$.18
Sharps Container	$6.59	1	1	$6.59
Biohazard Bags	$11.90	50	1	$.24
TB Investigator Hourly Rate	$28.08	1	.2	$5.62
Total				*$16.21*

Costs of Medical Evaluation Activities

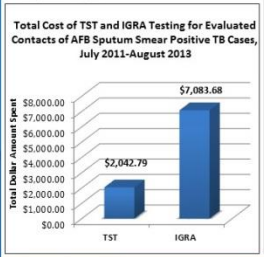
Item	# of Units Needed	Cost
Chest X-ray	1	$82.00
Nurse Practitioner Hourly Rate	.33	$26.40
Standard Mileage Rt 2014	1	$.56
TST	1	$16.21
IGRA	1	$74.56

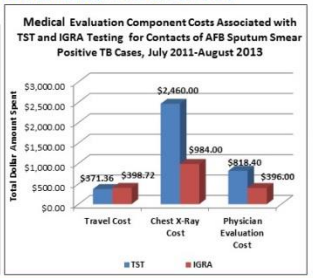
Cost to Perform an IGRA

Item	Cost	# Units Per Package	# Units Needed for Test	Cost for Test
T-Spot Lab Cost	$55.00	1	1	$55.00
Vacutainer Tube	$472.45	100	1	$4.72
Vacutainer Holder	$15.25	250	1	$.06
Vacutainer Butterfly Needles	$77.30	50	1	$1.55
Alcohol Wipes	$3.95	80	2	$.10
Tourniquet	$2.68	10	1	.27
Gauze Pads	$6.79	100	2	$.14
Band-Aids	$8.99	100	1	$.09
Gloves	$8.75	100	2	$.18
Sharps Container	$6.59	1	1	$6.59
Biohazard Bags	$11.90	50	1	$.24
TB Investigator Hourly Rate	$28.08	1	.2	$5.62
Total				*$74.56*

RESULTS

From 7/31/11-7/31/12, 13 AFB sputum smear positive patients were investigated and 126 TSTs were performed totaling $2,042.79 in cost. These screening tests led to 663.16 miles traveled, 30 chest x-rays and 31 medical examinations, with total costs of $371.36, $2460.00 and $818.40, respectively. From 8/1/12-8/1/13, 11 AFB sputum smear positive patients were investigated and 95 IGRAs were performed totaling $7,083.40 in cost. These screening tests led to 712 miles traveled, 12 chest x-rays and 15 medical examinations, with total costs of $398.72, $984.00 and $396.00, respectively.





CONCLUSION

Doing more with less has become a public health mantra – especially for TB control programs. For those programs still providing direct services, even small changes can lead to significant costs and benefits. Switching from TST to IGRA screening of close contacts of AFB sputum smear positive TB cases in Washington, DC significantly increased the overall cost (from $5,692.55 to $8862.12) but decreased by more than 50% the number of chest x-rays and medical evaluations performed. For integrated programs like ours, with a shared budget but a clinic predominantly run by volunteer physicians, the benefit of less provider contact ultimately outweighed the additional cost of the test.

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What suggestions do you have?

Some Suggestions

- Try to include more white space.
- Try to break up blocks of text, for example by including some bullets.
- Consider whether the tables really belong in the methods section.
- Make the graphs two-dimensional rather than three-dimensional.
- Other

Ethnic and Regional Differences in Neutrophil Counts and Neutropenia Reporting, with Related Findings, in Two International Clinical Trials of Rifapentine and Rifampicin for Tuberculosis Treatment

Ruth N. Moro (1,6), John L. Johnson (2, 3), Chi-Chiu Leung (4), Kwok-Chiu Chang (4), Andrey Borisov (1), Neil Martinson (5), Stefan Goldberg (1)

Background

- Variation in the level of Absolute Neutrophil Count (ANC) and other hematological and chemistry values between Africans and other populations has been reported [1,2].
- Neutropenia has been associated with rifamycin use.
- Definitions and clinical manifestations of neutropenia might differ between populations.
- The National Cancer Institute's Common Toxicity Criteria (CTC) and the National Institute of Allergy and Infectious Diseases Division of AIDS (DAIDS) tables are commonly used to assign severity grades to laboratory values, although the scales have not been assessed in different populations.
- Different scales might affect safety results reported from clinical trials.

Objectives

- To identify possible ethnic and regional variation of ANC and other hematological and chemistry values at baseline.
- To determine sex and age influence among these groups.
- To identify CTC grade 3 adverse events: neutropenia, anemia, thrombocytopenia, renal failure, and hepatitis, stratified by race and region.
- To compare the use of CTC vs. DAIDS in the reporting of safety data.

Methods

- The Tuberculosis Trials Consortium recently completed two international phase 2 randomized CT in HIV-infected and uninfected adults using rifapentine (P) in place of rifampicin (R) during the first two months of otherwise standard TB treatment in Brazil, Canada, Hong Kong, Kenya, Peru, South Africa, Spain, Uganda, U.S., and Vietnam. [3,4]
- 337 participants received R10mg/kg, and three groups of 361, 81, and 81 received P10, P15, and P20mg/kg, respectively.
- ANC, white blood cells (WBC), hemoglobin, platelets, creatinine, alanine aminotransferase (ALT), and bilirubin were evaluated at baseline, and at 2, 4, 6, 8, and 12 weeks. We compared black vs. non-black, and African vs. non-African populations.
- A median Two-Sample Test for normally distributed samples and a non-parametric test for non-normally distributed samples were used to evaluate the distribution of ANC and other hematological and chemistry values at baseline, categorized by sex and median age.
- Grade 3 neutropenia events were defined based on CTCv2.0 (<1000-500/mm^3) or DAIDSv2.0 (<600-400/mm^3) criteria.
- Fisher's exact test was used to evaluate the rate of events between the ethnic and regional populations evaluated.

Ethnic and Regional Differences in Baseline Hematology and Chemistry in TBTC Studies 29 and 29x (N=860)

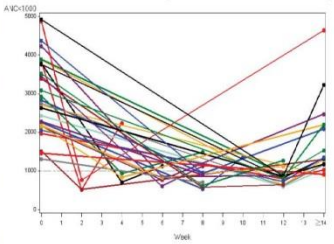
	Black (n=513)	Non-black (n=347)	p-value*	Black African (n=435)	Black, Not African (n=78)	p-value*	Black, Not African (n=78)	Non-black, Not African (n=344)	p-value*
Absolute Neutrophil Counts/mm^3 Median									
Female	4935	5200	0.002	4610	6633	0.047	6633	5200	0.214
Male	4980	6147	<0.001	4900	5400	0.038	5400	6149	0.032
p-value*	0.248	0.011		0.051	0.459		0.459	0.012	
White Blood Cells x10^3/mm^3 Median									
Female	7.7	7.8	0.195	7.7	9.3	0.094	9.3	7.8	0.244
Male	8.1	8.8	0.007	8.1	8.1	0.664	8.1	8.7	0.063
p-value*	0.356	0.025		0.251	0.913		0.913	0.032	
Hemoglobin g/dL Median									
Female	11.2	12.1	0.002**	11.2	11.2	0.869	11.2	12.05	0.085
Male	12.6	13.3	<0.001**	12.5	12.7	0.813	12.7	13.3	0.091
p-value**	<0.001	<0.001		<0.001	0.006		0.006	<0.001	
Platelets counts x10^3/mm^3 Median									
Female	427	358	0.001	430	403	0.807	403	358	0.126
Male	403	351	<0.001	415	341	0.001	341	350	0.924
p-value*	0.173	0.677		0.629	0.119		0.119	0.630	
Creatinine mg/dL Median									
Female	0.6	0.7	0.411	0.6	0.7	0.156	0.7	0.7	0.967
Male	0.7	0.8	<0.001	0.7	0.8	0.001	0.8	0.8	0.266
p-value*	<0.001	<0.001		<0.001	0.046		0.046	<0.001	
Alanine Aminotransferase U/L Median									
Female	15	17	0.024	15	18	0.177	18	17	0.881
Male	17	22	0.0004	17	18	0.289	18	21.5	0.120
p-value*	0.005	0.005		0.002	0.998		0.998	0.007	
Total Bilirubin mg/dL Median									
Female	0.4	0.4	0.120	0.4	0.3	0.341	0.3	0.4	0.105
Male	0.5	0.5	0.066	0.5	0.5	0.655	0.5	0.5	0.989
p-value*	0.001	0.076		0.008	0.029		0.029	0.093	

* Two sample Kolmogorov-Smirnov (Asymptotic) test, a non-parametric test due to a not normally distributed sample
**Median Two-Sample Test in a normally distributed sample. Female (n=270) Male (n=590)

Reported Hematologic Adverse Events and Hepatitis in TBTC Studies 29 and 29x, Stratified by Race and Region

	Black				Non-black				Black African*				Black, Not African				Black, Not African				Non-black, Not African			
	R 10	P 10	P 15	P 20	R 10	P 10	P 15	P 20	R 10	P 10	P 15	P 20	R 10	P 10	P 15	P 20	R 10	P 10	P 15	P 20	R 10	P 10	P 15	P 20
Neutropenia† (n=32)																								
Female	4	6	2	1					4	6	2	1												
Male	6	9	2	2					4	7	2	2	2	2			2	2						
Anemia† (n=4)																								
Female	1	1							1	1														
Male	2								2															
Hepatitis‡ (n=34)																								
Female	4			1		1			3			1	1				1					1		
Male	3	6	1	1	5	9	2	1	2	2	1		1	4		1	1	4		1	5	9	2	1

Identified Neutropenia Events During TB Treatment (ANC <1000 /mm^3), Showing Baseline, Nadir, and Recovery



Comparison of Reporting Adverse Events of Severity ≥Grade 3 according to Common Toxicity Criteria (CTC) v2.0 vs. Division of AIDS (DAIDS) v2.0 criteria

	CTC	Events (n)	DAIDS v2	Events (n)
ANC (xmm^3)	<1000-500	32	<600-400	4
Hemoglobin (g/dL)	<8.0-6.5	4	<9.0-7.0	4
ALT (U/L)	<20.0-5.0	34	<10.0-5.0	34

CTCv2.0, grade 4 events: neutropenia=0, anemia=0, hepatitis=4
Cancer Therapy Evaluation Program. The Revised Common Toxicity Criteria" version 2.0/1999 http://prevention.cancer.gov/files/clinical-trials/common-toxicity-criteria.pdf
National Institute of Allergy and Infectious Diseases Division of AIDS (DAIDS) 2014 http://rsc.tech-res.com/Document/safetyandpharmacovigilance/DAIDS_AE_GRADING_TABLE_v2_NOV2014.pdf

Abbreviations: **R10 (Rifampin 10 mg/kg), P10 (Rifapentine 10 mg/kg), P15 (Rifapentine 15 mg/kg), P20 (Rifapentine 20 mg/kg)**
*African: living in an African country at enrollment
† Grade 3 toxicity (neutropenia: absolute neutrophil count <1000 cells/mm^3; anemia: Hgbc8g/dL), based on the Common Toxicity Criteria (CTC) v2.0
‡ Hepatitis was defined as transaminases ≥ 5times upper limit of normal (uln) or ≥ 3 times uln with symptoms, or bilirubin ≥ 3 times uln, or determine d by site investigator to have a new diagnosis of hepatitis.

Results

- 860 participants received at least 1 dose of study drugs, 590 (69%) were male, 86 (10%) were HIV-infected and the median age was 33.
- Black, compared to non-black participants had lower values of ANC, hemoglobin, ALT, and WBC and creatinine in men. Platelet count was higher in blacks. Hemoglobin and creatinine were lower in female participants regardless of race or region of enrollment.
- No major differences were found after stratifying by median age instead of gender (not shown).
- Among black participants, baseline median ANC was lower in those living in African countries. Among participants living outside Africa, blacks had similar baseline median ANC values compared to non-blacks.
- **32(3.7%) neutropenia events were reported, all of them in black participants and 28/32 in blacks living in African countries**. One subject developed fever. All improved and none required interruption of treatment.
- No clear pattern in time to ANC nadir and recovery was found (see scatter plot).
- Neutropenia event rates did not differ by treatment arm or dose, Study29: R10mg (8/254[3.1%), P10mg (10/275[3.6%) (p-value: 0.95), Study29c: R10mg (2/83[2.4%]), P10mg (5/86[5.8%]), P15mg (4/81[4.9%]), P20mg (3/81[3.7%]) (p-value=0.76).
- No events of renal failure or thrombocytopenia were reported.
- In contrast to neutropenia and anemia events congregated in black Africans, hepatitis events were not more frequently present in any ethnic/regional population.
- If DAIDS criteria were applied, only 4 neutropenia events would have been reported due to lower ANC cutoff.

Conclusions

- Compared with non-black participants, black participants had lower baseline ANC values and a higher frequency of Grade 3 neutropenic events using the CTC scoring system.
- Consideration of the participant population and the clinical implications of neutropenia might be helpful in optimizing neutropenia reporting definitions for TB CT.

Reference

(1) Zeh C, Amornkul P, Inzaule S et al. Population-Base Biochemistry, Immunologic and Hematological Reference Values for Adolescents and Young Adults In a Rural Population in Western Kenya. *PLoS ONE* June 2011; 6 (6); e21040.
(2) Hsieh M, Tisdale J, Rodgers G et al. Neutrophil Count In African Americans: Lowering the TargetCutoff to Initiate or Resume Chemotherapy? *Journal of Clinical Oncology*. April 1 2010; 8 (10); 1633-1637.
(3) Dorman s, Goldberg S, Stout J et al. Substitution of Rifapentine for Rifampin During Intensive Phase Treatment of Pulmonary Tuberculosis; Study 29 of the Tuberculosis Trials Consortium. The Journal infectious diseases, 2012 Oct 1; 206(7):1030-40
(4) Dorman S, Savic R, Goldberg S et al. Daily Rifapentine for Treatment of Pulmonary Tuberculosis. Randomized Dose-Ranging Trial. Am J Respir Crit Care Med 2015;191:333-343

Affiliations

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[3]Case Western Reserve University School of Medicine, Cleveland, OH, USA
[4]Tuberculosis and Chest Service, Department of Health, Hong Kong, China
[5]Perinatal HIV Research Unit, University of the Witwatersrand, Johannesburg South Africa and Johns Hopkins University Center for TB Research, Baltimore MD
[6]CDC Foundation, Atlanta GA, USA – Sanofi has provided funding to the CDC Foundation to support rifapentine research.

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What are some strengths of this poster?

Some Strengths

- Well-balanced design, with tables and figure in center panel and text in side panels
- Use of color to help make subheadings stand out
- Use of bulleted text rather than paragraphs
- Cohesive color scheme
- Other

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Female	4			1		1			3			1	1				1					1		
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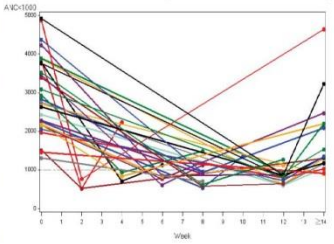
Identified Neutropenia Events During TB Treatment (ANC <1000 /mm^3), Showing Baseline, Nadir, and Recovery



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CTCv2.0, grade 4 events: neutropenia=0, anemia=0, hepatitis=4
Cancer Therapy Evaluation Program. The Revised Common Toxicity Criteria" version 2.0/1999 http://prevention.cancer.gov/files/clinical-trials/common-toxicity-criteria.pdf
National Institute of Allergy and Infectious Diseases Division of AIDS (DAIDS) 2014 http://rsc.tech-res.com/Document/safetyandpharmacovigilance/DAIDS_AE_GRADING_TABLE_v2_NOV2014.pdf

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- **32(3.7%) neutropenia events were reported, all of them in black participants and 28/32 in blacks living in African countries**. One subject developed fever. All improved and none required interruption of treatment.
- No clear pattern in time to ANC nadir and recovery was found (see scatter plot).
- Neutropenia event rates did not differ by treatment arm or dose, Study29: R10mg (8/254[3.1%), P10mg (10/275[3.6%] (p-value: 0.95), Study29x: R10mg (2/83[2.4%]), P10mg (5/86[5.8%]), P15mg (4/81[4.9%]), P20mg (3/81[3.7%]) (p-value=0.76).
- No events of renal failure or thrombocytopenia were reported.
- In contrast to neutropenia and anemia events congregated in black Africans, hepatitis events were not more frequently present in any ethnic/regional population.
- If DAIDS criteria were applied, only 4 neutropenia events would have been reported due to lower ANC cutoff.

Conclusions

- Compared with non-black participants, black participants had lower baseline ANC values and a higher frequency of Grade 3 neutropenic events using the CTC scoring system.
- Consideration of the participant population and the clinical implications of neutropenia might be helpful in optimizing neutropenia reporting definitions for TB CT.

Reference

(1) Zeh C, Amornkul P, Inzaule S et al. Population-Base Biochemistry, Immunologic and Hematological Reference Values for Adolescents and Young Adults in a Rural Population in Western Kenya. *PLoS ONE* June 2011; 6 (6): e21040.
(2) Hsieh M, Tisdale J, Rodgers G et al. Neutrophil Count in African Americans: Lowering the Target Cutoff to Initiate or Resume Chemotherapy? *Journal of Clinical Oncology*. April 1 2010; 8 (10); 1633-1637.
(3) Dorman s, Goldberg S, Stout J et al. Substitution of Rifapentine for Rifampin During Intensive Phase Treatment of Pulmonary Tuberculosis; Study 29 of the Tuberculosis Trials Consortium. The Journal infectious diseases, 2012 Oct 1; 206(7):1030-40
(4) Dorman S, Savic R, Goldberg S et al. Daily Rifapentine for Treatment of Pulmonary Tuberculosis. Randomized Dose-Ranging Trial. Am J Respir Crit Care Med 2015;191:333-343

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[6]CDC Foundation, Atlanta GA, USA – Sanofi has provided funding to the CDC Foundation to support rifapentine research.

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What suggestions do you have?

Some Suggestions

- Try to include more white space.
- Consider whether it is clear enough what the lines in the graph represent.
- Other

Systematic Review and Meta-Analysis of Treatment of Latent TB Infection to Reduce Progression to Multidrug-Resistant Tuberculosis

Suzanne M. Marks, MPH, MA[1] and Sundari Mase, MD[1]

[1] U.S. Centers for Disease Control and Prevention (CDC), Atlanta, Georgia

BACKGROUND

- Evidence-based recommendations for treatment of contacts to multidrug-resistant (MDR) TB patients are lacking because of small studies. TB incidence in contacts to MDR-TB patients treated for latent MDR-TB infection (LTBI) is unknown

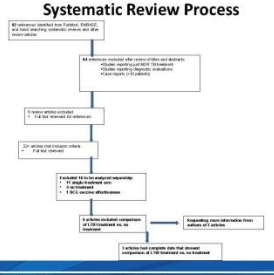
OBJECTIVES

- To conduct a systematic review of published studies to assess TB incidence with and without LTBI treatment in contacts to infectious MDR TB patients
- To conduct a meta-analysis of the association of latent MDR TB Infection treatment with TB incidence

METHODS

- In December 2014, we conducted a systematic review of published studies in PubMed, EMBASE, and Cochrane Library.
- We searched for the key words: tuberculosis, multidrug resistant, contacts, and treatment.
- We considered contacts effectively treated if they were on ≥ one medication to which their likely MDR-TB strain was susceptible.
- We estimated a pooled random effects relative risk (RR) and its 95% confidence interval.

Systematic Review Process



RESULTS

Comparison Study #1

Denholm JT, Leslie DE, Jenkin GA, et al. Long-term follow-up of contacts exposed to multidrug-resistant tuberculosis in Victoria, Australia, 1995-2010. IJTLD. 2012:16(10):1320-1325.

- Setting: Australia
- Time period: 1995-2010
- Subjects: N=49 with LTBI of 570 contacts to MDR-TB patients, median age 27
- Study type: Retrospective review, retrieved isolates of index cases, ~5 years of follow up
- n=11 received effective (≥ 1 med to which their strain was susceptible) treatment with 1-2 meds for 9 months
  - treated mostly MOX alone or with EMB; PZA with EMB, INH, or RIF; CIP alone or with PZA
  - Outcomes: No (0%) TB cases
- n=38 considered not effectively treated
  - Outcomes: 2 (5%) TB cases

Comparison Study #2

Bamrah S, Brostrom R, Dorina F, et al. Treatment for Multidrug-Resistant Latent Tuberculosis Infection—Federated States of Micronesia, 2009–2012. IJTLD. 2014:18(8):912-919.

- Setting: Chuuk, Micronesia
- Time period: 2009-2012
- Subjects: N=119 with LTBI of contacts of MDR-TB patients, median age of those starting treatment was 24
- Study type: Prospective observational study with 36 months of follow up
- n=104 received 12 months daily treatment (mostly FQ: MOX/LEV, EMB, combo)
  - 89% completed
  - Outcomes: No (0%) TB cases; No serious adverse events (hospitalization, irreversible morbidity), although 15% reported adverse events
- n=15 refused or discontinued treatment within 2 weeks.
  - Outcomes: 3 (20%) TB cases

Comparison Study #3

Schaaf et al. Evaluation of Young Children in Contact with Adult Multidrug-resistant Pulmonary Tuberculosis: A 30-Month Follow-up. Pediatrics 2002; 109:765.

- Setting: Western Cape Province, South Africa
- Time period: 1994-2000
- Subjects: N=105 children < 5 yrs. of age, household contacts
- Study type: prospective observational study with 30 months of follow up
- n=41 received 3-4 drug combinations of INH/PZA/EMB/ETH (6 with OFL) for 6-12 months
  - Outcomes: 2 (5%) TB cases
- n=64 no treatment
  - Outcomes: 13 (20%) TB cases

Complete Data from 3 Comparison Studies

Denholm	TB	No TB	Total	
LTBI Tx	0 (0.5)	11	11	RR=0.826087 CI (0.04-17.06)
No LTBI Tx	2	36	38	
Total	2.5	47	49	

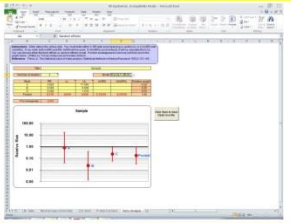
Bamrah	TB	No TB	Total	
LTBI Tx	0 (0.5)	104	104	RR=0.023923 CI (0.001-0.4)
No LTBI Tx	3	12	15	
Total	3	116	119	

Schaaf	TB	No TB	Total	
LTBI Tx	2	39	41	RR=0.24015 CI (0.06-1.01)
No LTBI Tx	13	51	64	
Total	15	90	105	

Pooled RR=0.08 CI (0.02-0.35)

Results of Meta-analysis of 3 Studies (Denholm, Bamrah, Schaaf 2002)

Pooled Random Effects Relative Risk=0.179 (0.034-0.929)



- Assessment of Heterogeneity of the 3 Studies p=0.214: relatively homogenous
- Possible reasons for some heterogeneity:
  - Sample size (60, 119, 105)
  - Overall TB incidence (4% Australia, 3% Chuuk, 14% S. Africa)

CONCLUSIONS

- Very few studies met the inclusion criteria, so results should be cautiously interpreted.
- However, we found, by using meta-analysis, some empirical evidence for the effectiveness of LTBI treatment to prevent MDR TB.

CONTACT INFO

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What are some strengths of this poster?

Some Strengths

- Inclusion of flowchart
- Good focus: results presented in middle panel
- Good parallelism: each study presented in the same way
- Concise statement of conclusions
- Other

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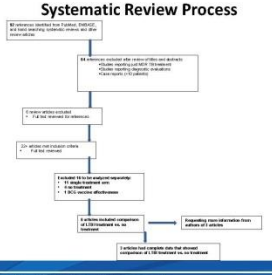

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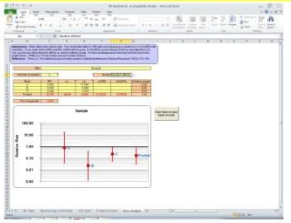

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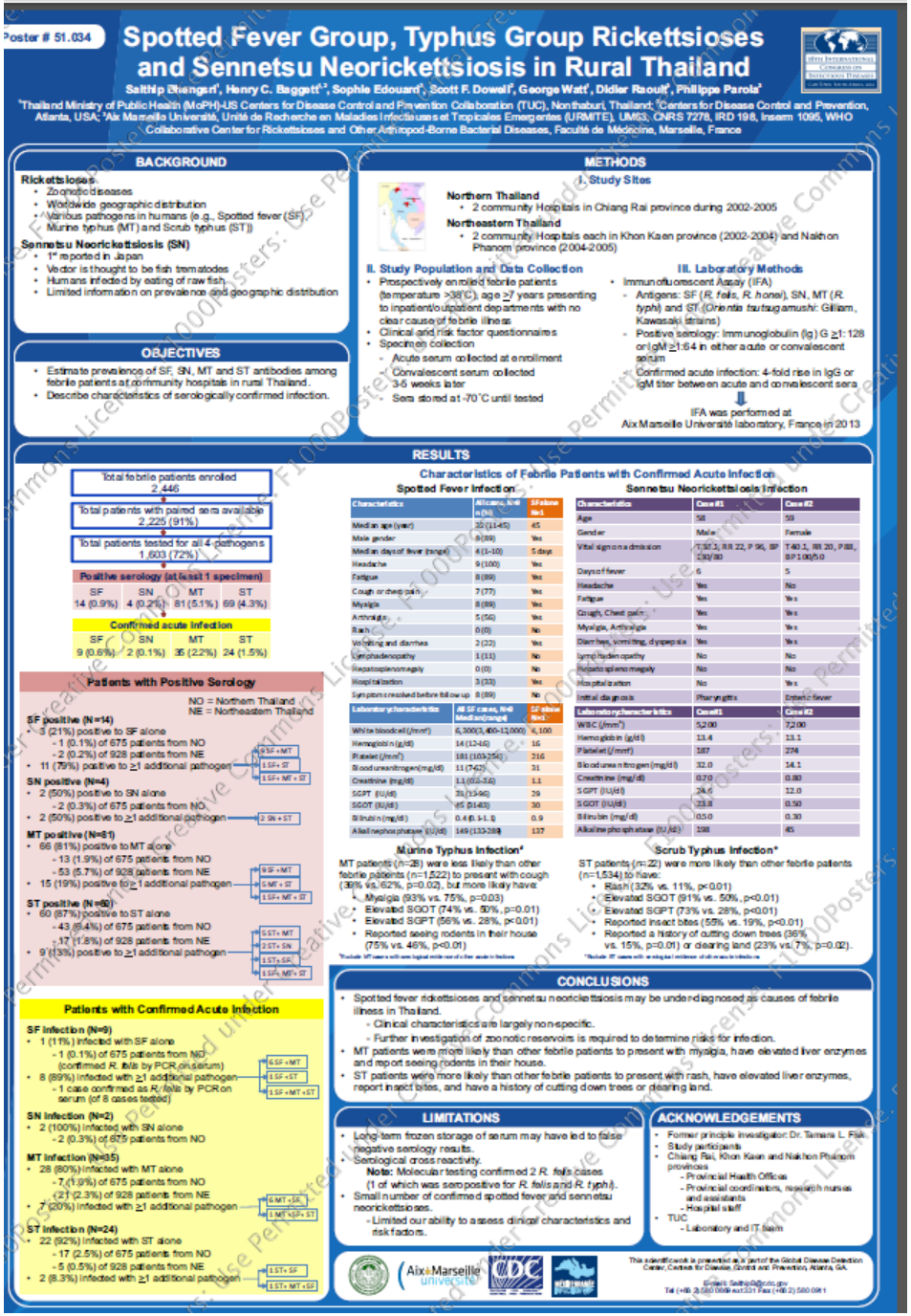
What suggestions do you have?

Some Suggestions

- Perhaps word title more readably (an option: “Treatment of _____: Systematic review . . . ”)
- Perhaps increase the type size of the title.
- Try to put the flowchart higher on the poster.
- Make sure that text blocks have ample margins at the top, bottom, and sides.
- Other



Poster # 51.034

Spotted Fever Group, Typhus Group Rickettsioses and Sennetsu Neorickettsiosis in Rural Thailand

Salthip Blacksell[1], Henry C. Baggett[1,2], Sophie Edouard[3], Scott F. Dowell[2], George Watt[1], Didier Raoult[3], Philippe Parola[3]

[1]Thailand Ministry of Public Health (MoPH)-US Centers for Disease Control and Prevention Collaboration (TUC), Nonthaburi, Thailand; [2]Centers for Disease Control and Prevention, Atlanta, USA; [3]Aix Marseille Université, Unité de Recherche en Maladies Infectieuses et Tropicales Emergentes (URMITE), UM63, CNRS 7278, IRD 198, Inserm 1095, WHO Collaborative Center for Rickettsioses and Other Arthropod-Borne Bacterial Diseases, Faculté de Médecine, Marseille, France

BACKGROUND

Rickettsioses
- Zoonotic diseases
- Worldwide geographic distribution
- Various pathogens in humans (e.g., Spotted fever (SF), Murine typhus (MT) and Scrub typhus (ST))

Sennetsu Neorickettsiosis (SN)
- 1st reported in Japan
- Vector is thought to be fish trematodes
- Humans infected by eating of raw fish
- Limited information on prevalence and geographic distribution

OBJECTIVES

- Estimate prevalence of SF, SN, MT and ST antibodies among febrile patients at community hospitals in rural Thailand.
- Describe characteristics of serologically confirmed infection.

METHODS

I. Study Sites

Northern Thailand
- 2 community Hospitals in Chiang Rai province during 2002-2005

Northeastern Thailand
- 2 community Hospitals each in Khon Kaen province (2002-2004) and Nakhon Phanom province (2004-2005)

II. Study Population and Data Collection

- Prospectively enrolled febrile patients (temperature >38°C), age ≥7 years presenting to inpatient/outpatient departments with no clear cause of febrile illness
- Clinical and risk factor questionnaires
- Specimen collection
  - Acute serum collected at enrollment
  - Convalescent serum collected 3-6 weeks later
  - Sera stored at -70°C until tested

III. Laboratory Methods

- Immunofluorescent Assay (IFA)
  - Antigens: SF (*R. felis*, *R. honei*), SN, MT (*R. typhi*) and ST (*Orientia tsutsugamushi*: Gilliam, Kawasaki strains)
  - Positive serology: Immunoglobulin (Ig) G ≥1:128 or IgM ≥1:64 in either acute or convalescent serum
  - Confirmed acute infection: 4-fold rise in IgG or IgM titer between acute and convalescent sera

IFA was performed at Aix Marseille Université laboratory, France in 2013

RESULTS

Total febrile patients enrolled 2,446

Total patients with paired sera available 2,225 (91%)

Total patients tested for all 4 pathogens 1,603 (72%)

Positive serology (at least 1 specimen)

SF	SN	MT	ST
14 (0.9%)	4 (0.2%)	81 (5.1%)	69 (4.3%)

Confirmed acute infection

SF	SN	MT	ST
9 (0.6%)	2 (0.1%)	35 (2.2%)	24 (1.5%)

Patients with Positive Serology

NO = Northern Thailand
NE = Northeastern Thailand

SF positive (N=14)
- 3 (21%) positive to SF alone
  - 1 (0.1%) of 675 patients from NO
  - 2 (0.2%) of 928 patients from NE
- 11 (79%) positive to ≥1 additional pathogen → 9 SF + MT; 1 SF + ST; 1 SF + MT + ST

SN positive (N=4)
- 2 (50%) positive to SN alone
  - 2 (0.3%) of 675 patients from NO
- 2 (50%) positive to ≥1 additional pathogen → 2 SN + ST

MT positive (N=81)
- 66 (81%) positive to MT alone
  - 13 (1.9%) of 675 patients from NO
  - 53 (5.7%) of 928 patients from NE
- 15 (19%) positive to ≥1 additional pathogen → 9 SF + MT; 5 MT + ST; 1 SF + MT + ST

ST positive (N=69)
- 60 (87%) positive to ST alone
  - 43 (6.4%) of 675 patients from NO
  - 17 (1.8%) of 928 patients from NE
- 9 (13%) positive to ≥1 additional pathogen → 5 ST + MT; 2 ST + SN; 1 ST + SF; 1 SF + MT + ST

Patients with Confirmed Acute Infection

SF infection (N=9)
- 1 (11%) infected with SF alone
  - 1 (0.1%) of 675 patients from NO (confirmed *R. felis* by PCR on serum)
- 8 (89%) infected with ≥1 additional pathogen → 6 SF + MT; 1 SF + ST; 1 SF + MT + ST
  - 1 case confirmed as *R. felis* by PCR on serum (of 8 cases tested)

SN infection (N=2)
- 2 (100%) infected with SN alone
  - 2 (0.3%) of 675 patients from NO

MT infection (N=35)
- 28 (80%) infected with MT alone
  - 7 (1.0%) of 675 patients from NO
  - 21 (2.3%) of 928 patients from NE
- 7 (20%) infected with ≥1 additional pathogen → 6 MT + SN; 1 MT + SF + ST

ST infection (N=24)
- 22 (92%) infected with ST alone
  - 17 (2.5%) of 675 patients from NO
  - 5 (0.5%) of 928 patients from NE
- 2 (8.3%) infected with ≥1 additional pathogen → 1 ST + SF; 1 ST + MT + SF

Characteristics of Febrile Patients with Confirmed Acute Infection

Spotted Fever Infection

Characteristics	All SF cases, N=9 n (%)	SF alone No.1
Median age (year)	10 (11-45)	45
Male gender	8 (89)	Yes
Median days of fever (range)	4 (1-10)	5 days
Headache	9 (100)	Yes
Fatigue	8 (89)	Yes
Cough or chest pain	7 (77)	Yes
Myalgia	8 (89)	Yes
Arthralgia	5 (56)	Yes
Rash	0 (0)	No
Vomiting and diarrhea	2 (22)	Yes
Lymphadenopathy	1 (11)	No
Hepatosplenomegaly	0 (0)	No
Hospitalization	3 (33)	Yes
Symptoms resolved before follow up	8 (89)	No
Laboratory characteristics	**All SF cases, N=9 Median(range)**	**SF alone No.1**
White blood cell (/mm³)	6,300(3,400-12,000)	4,100
Hemoglobin (g/dl)	14 (12-16)	16
Platelet (/mm³)	181 (103-256)	216
Blood urea nitrogen (mg/dl)	11 (7-62)	31
Creatinine (mg/dl)	1.1 (0.6-3.6)	1.1
SGPT (IU/dl)	31 (13-96)	29
SGOT (IU/dl)	65 (31-83)	30
Bilirubin (mg/dl)	0.4 (0.1-1.1)	0.9
Alkaline phosphatase (IU/dl)	149 (133-284)	137

Sennetsu Neorickettsiosis Infection

Characteristics	Case #1	Case #2
Age	58	59
Gender	Male	Female
Vital signs on admission	T 37.3, RR 22, P 96, BP 130/80	T 40.1, RR 20, P 88, BP 100/50
Days of fever	6	5
Headache	Yes	No
Fatigue	Yes	Yes
Cough, Chest pain	Yes	Yes
Myalgia, Arthralgia	Yes	Yes
Diarrhea, vomiting, dyspepsia	Yes	Yes
Lymphadenopathy	No	No
Hepatosplenomegaly	No	No
Hospitalization	No	Yes
Initial diagnosis	Pharyngitis	Enteric fever
Laboratory characteristics	**Case#1**	**Case#2**
WBC (/mm³)	5,200	7,200
Hemoglobin (g/dl)	13.4	13.1
Platelet (/mm³)	187	274
Blood urea nitrogen (mg/dl)	32.0	14.1
Creatinine (mg/dl)	0.70	0.80
SGPT (IU/dl)	24.6	12.0
SGOT (IU/dl)	23.8	0.50
Bilirubin (mg/dl)	0.50	0.30
Alkaline phosphatase (IU/dl)	198	45

Murine Typhus Infection*

MT patients (n=28) were less likely than other febrile patients (n=1,522) to present with cough (39% vs. 62%, p=0.02), but more likely have:
- Myalgia (93% vs. 75%, p=0.03)
- Elevated SGOT (74% vs. 30%, p<0.01)
- Elevated SGPT (56% vs. 28%, p<0.01)
- Reported seeing rodents in their house (75% vs. 46%, p<0.01)

*Include ST cases with serological evidence of other acute infections

Scrub Typhus Infection*

ST patients (n=22) were more likely than other febrile patients (n=1,534) to have:
- Rash (32% vs. 11%, p<0.01)
- Elevated SGOT (91% vs. 50%, p<0.01)
- Elevated SGPT (73% vs. 28%, p<0.01)
- Reported insect bites (55% vs. 19%, p<0.01)
- Reported a history of cutting down trees (36% vs. 15%, p=0.01) or clearing land (23% vs. 7%, p=0.02).

*Include ST cases with serological evidence of other acute infections

CONCLUSIONS

- Spotted fever rickettsioses and sennetsu neorickettsiosis may be underdiagnosed as causes of febrile illness in Thailand.
  - Clinical characteristics are largely non-specific.
  - Further investigation of zoonotic reservoirs is required to determine risks for infection.
- MT patients were more likely than other febrile patients to present with myalgia, have elevated liver enzymes and report seeing rodents in their house.
- ST patients were more likely than other febrile patients to present with rash, have elevated liver enzymes, report insect bites, and have a history of cutting down trees or clearing land.

LIMITATIONS

- Long-term frozen storage of serum may have led to false negative serology results.
- Serological cross reactivity.
  Note: Molecular testing confirmed 2 *R. felis* cases (1 of which was seropositive for *R. felis* and *R. typhi*).
- Small number of confirmed spotted fever and sennetsu neorickettsioses.
  - Limited our ability to assess clinical characteristics and risk factors.

ACKNOWLEDGEMENTS

- Former principle investigator: Dr. Tamara L. Fisk
- Study participants
- Chiang Rai, Khon Kaen and Nakhon Phanom provinces
  - Provincial Health Offices
  - Provincial coordinators, research nurses and assistants
  - Hospital staff
- TUC
  - Laboratory and IT team

This scientific work is presented as a part of the Global Disease Detection Center, Centers for Disease Control and Prevention, Atlanta, GA.

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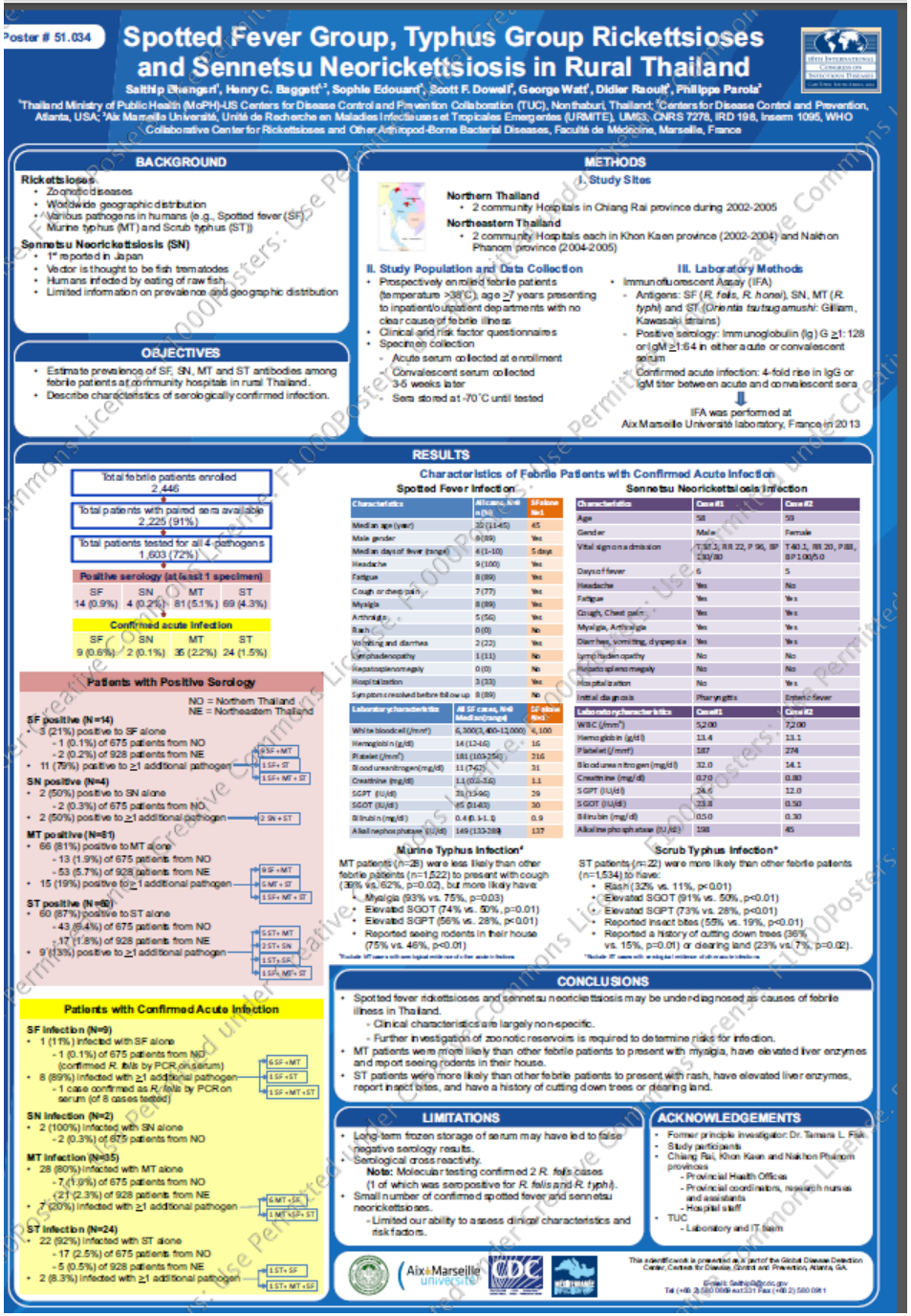
What are some strengths of this poster?

Some Strengths

- Large, easy-to-read type in title
- Inclusion of subheadings within sections
- Use of bulleted text rather than paragraphs
- Inclusion of limitations section
- Other



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II. Study Population and Data Collection

- Prospectively enrolled febrile patients (temperature >38°C), age ≥7 years presenting to inpatient/outpatient departments with no clear cause of febrile illness
- Clinical and risk factor questionnaires
- Specimen collection
  - Acute serum collected at enrollment
  - Convalescent serum collected 3-6 weeks later
  - Sera stored at -70°C until tested

III. Laboratory Methods

- Immunofluorescent Assay (IFA)
  - Antigens: SF (*R. felis*, *R. honei*), SN, MT (*R. typhi*) and ST (*Orientia tsutsugamushi*: Gilliam, Kawasaki strains)
  - Positive serology: Immunoglobulin (Ig) G ≥1:128 or IgM ≥1:64 in either acute or convalescent serum
  - Confirmed acute infection: 4-fold rise in IgG or IgM titer between acute and convalescent sera

IFA was performed at Aix Marseille Université laboratory, France in 2013

RESULTS

Total febrile patients enrolled 2,446

Total patients with paired sera available 2,225 (91%)

Total patients tested for all 4 pathogens 1,603 (72%)

Positive serology (at least 1 specimen)

SF	SN	MT	ST
14 (0.9%)	4 (0.2%)	81 (5.1%)	69 (4.3%)

Confirmed acute infection

SF	SN	MT	ST
9 (0.6%)	2 (0.1%)	35 (2.2%)	24 (1.5%)

Patients with Positive Serology

NO = Northern Thailand
NE = Northeastern Thailand

SF positive (N=14)
- 3 (21%) positive to SF alone
  - 1 (0.1%) of 675 patients from NO
  - 2 (0.2%) of 928 patients from NE
- 11 (79%) positive to ≥1 additional pathogen → 9 SF + MT; 1 SF + ST; 1 SF + MT + ST

SN positive (N=4)
- 2 (50%) positive to SN alone
  - 2 (0.3%) of 675 patients from NO
- 2 (50%) positive to ≥1 additional pathogen → 2 SN + ST

MT positive (N=81)
- 66 (81%) positive to MT alone
  - 13 (1.9%) of 675 patients from NO
  - 53 (5.7%) of 928 patients from NE
- 15 (19%) positive to ≥1 additional pathogen → 9 SF + MT; 5 MT + ST; 1 SF + MT + ST

ST positive (N=69)
- 60 (87%) positive to ST alone
  - 43 (6.4%) of 675 patients from NO
  - 17 (1.8%) of 928 patients from NE
- 9 (13%) positive to ≥1 additional pathogen → 5 ST + MT; 2 ST + SN; 1 ST + SF; 1 SF + MT + ST

Patients with Confirmed Acute Infection

SF infection (N=9)
- 1 (11%) infected with SF alone
  - 1 (0.1%) of 675 patients from NO (confirmed *R. felis* by PCR on serum)
- 8 (89%) infected with ≥1 additional pathogen → 6 SF + MT; 1 SF + ST; 1 SF + MT + ST
  - 1 case confirmed as *R. felis* by PCR on serum (of 8 cases tested)

SN infection (N=2)
- 2 (100%) infected with SN alone
  - 2 (0.3%) of 675 patients from NO

MT infection (N=35)
- 28 (80%) infected with MT alone
  - 7 (1.0%) of 675 patients from NO
  - 21 (2.3%) of 928 patients from NE
- 7 (20%) infected with ≥1 additional pathogen → 6 MT + SF; 1 MT + SF + ST

ST infection (N=24)
- 22 (92%) infected with ST alone
  - 17 (2.5%) of 675 patients from NO
  - 5 (0.5%) of 928 patients from NE
- 2 (8.3%) infected with ≥1 additional pathogen → 1 ST + SF; 1 ST + MT + SF

Characteristics of Febrile Patients with Confirmed Acute Infection

Spotted Fever Infection

Characteristics	All SF cases, N=9 n (%)	SF alone No.
Median age (year)	10 (11-45)	45
Male gender	8 (89)	Yes
Median days of fever (range)	4 (1-10)	5 days
Headache	9 (100)	Yes
Fatigue	8 (89)	Yes
Cough or chest pain	7 (77)	Yes
Myalgia	8 (89)	Yes
Arthralgia	5 (56)	Yes
Rash	0 (0)	No
Vomiting and diarrhea	2 (22)	Yes
Lymphadenopathy	1 (11)	No
Hepatosplenomegaly	0 (0)	No
Hospitalization	3 (33)	Yes
Symptoms resolved before follow up	8 (89)	No
Laboratory characteristics		
White blood cell (/mm³)	6,300(3,400-12,000)	4,100
Hemoglobin (g/dl)	14 (12-16)	16
Platelet (/mm³)	181 (103-256)	216
Blood urea nitrogen (mg/dl)	11 (7-62)	31
Creatinine (mg/dl)	1.1 (0.6-3.6)	1.1
SGPT (IU/dl)	31 (13-96)	29
SGOT (IU/dl)	65 (31-83)	30
Bilirubin (mg/dl)	0.4 (0.1-1.1)	0.9
Alkaline phosphatase (IU/dl)	149 (133-284)	137

Sennetsu Neorickettsiosis Infection

Characteristics	Case #1	Case #2
Age	58	59
Gender	Male	Female
Vital signs on admission	T 37.3, RR 22, P 96, BP 130/80	T 40.1, RR 20, P 88, BP 100/50
Days of fever	6	5
Headache	Yes	No
Fatigue	Yes	Yes
Cough, Chest pain	Yes	Yes
Myalgia, Arthralgia	Yes	Yes
Diarrhea, vomiting, dyspepsia	Yes	Yes
Lymphadenopathy	No	No
Hepato splenomegaly	No	No
Hospitalization	No	Yes
Initial diagnosis	Pharyngitis	Enteric fever
Laboratory characteristics	**Case #1**	**Case #2**
WBC (/mm³)	5,200	7,200
Hemoglobin (g/dl)	13.4	13.1
Platelet (/mm³)	187	274
Blood urea nitrogen (mg/dl)	32.0	14.1
Creatinine (mg/dl)	0.70	0.80
SGPT (IU/dl)	24.6	12.0
SGOT (IU/dl)	23.8	0.50
Bilirubin (mg/dl)	0.50	0.30
Alkaline phosphatase (IU/dl)	198	45

Murine Typhus Infection*

MT patients (n=28) were less likely than other febrile patients (n=1,522) to present with cough (39% vs. 62%, p=0.02), but more likely have:
- Myalgia (93% vs. 75%, p=0.03)
- Elevated SGOT (74% vs. 30%, p<0.01)
- Elevated SGPT (56% vs. 28%, p<0.01)
- Reported seeing rodents in their house (75% vs. 46%, p<0.01)

*Include ST cases with serological evidence of co-acute infection

Scrub Typhus Infection*

ST patients (n=22) were more likely than other febrile patients (n=1,534) to have:
- Rash (32% vs. 11%, p<0.01)
- Elevated SGOT (91% vs. 50%, p<0.01)
- Elevated SGPT (73% vs. 28%, p<0.01)
- Reported insect bites (55% vs. 19%, p<0.01)
- Reported a history of cutting down trees (36% vs. 15%, p=0.01) or clearing land (23% vs. 7%, p=0.02).

*Include ST cases with serological evidence of co-acute infection

CONCLUSIONS

- Spotted fever rickettsioses and sennetsu neorickettsiosis may be underdiagnosed as causes of febrile illness in Thailand.
  - Clinical characteristics are largely non-specific.
  - Further investigation of zoonotic reservoirs is required to determine risks for infection.
- MT patients were more likely than other febrile patients to present with myalgia, have elevated liver enzymes and report seeing rodents in their house.
- ST patients were more likely than other febrile patients to present with rash, have elevated liver enzymes, report insect bites, and have a history of cutting down trees or clearing land.

LIMITATIONS

- Long-term frozen storage of serum may have led to false negative serology results.
- Serological cross reactivity.
  - **Note:** Molecular testing confirmed 2 *R. felis* cases (1 of which was seropositive for *R. felis* and *R. typhi*).
- Small number of confirmed spotted fever and sennetsu neorickettsioses.
  - Limited our ability to assess clinical characteristics and risk factors.

ACKNOWLEDGEMENTS

- Former principle investigator: Dr. Tamara L. Fisk
- Study participants
- Chiang Rai, Khon Kaen and Nakhon Phanom provinces
  - Provincial Health Offices
  - Provincial coordinators, research nurses and assistants
  - Hospital staff
- TUC
  - Laboratory and IT team

This scientific work is presented as a part of the Global Disease Detection Center, Centers for Disease Control and Prevention, Atlanta, GA.

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What suggestions do you have?

Some Suggestions

- Consider using a more harmonious color scheme.
- Try to make the poster less cluttered.
- Consider structuring the poster in an easier-to-follow way.
- Especially if the current structure is retained, consider making the section headings more prominent.
- Other

More Posters for Potential Consideration

Modeling enzootic raccoon rabies from land use patterns – Georgia (USA) 2006-2010

By: John E Duke[1,2], Jesse Blanton[2], Melissa Ivey[3], Charles Rupprecht [2]

Abstract

GIS analysis was used to substantiate the use of a weighted variable for a study to explore how land-use patterns might affect the reservoir of a zoonotic disease. The data that is provided by the public health department on cases of rabies in wildlife is reported at the county level and is a passive type of surveillance. Higher populated counties do more testing because there are more people that come into contact with wildlife, especially where urbanization encroaches on habitat. A standardizing variable on the right side of a logistic model helped to normalize the polygons of analysis (county in this study) so that results are more compelling. Low intensity residential development was positively associated with reported rabid raccoons while evergreen forest was negatively associated. These results have implications for tailoring the Oral Rabies Vaccination (ORV) programs along the enzootic front.

Introduction

The terrestrial reservoir for rabies in Georgia is the raccoon [1]. Ecologically, it seems that raccoons adapt to development well, both agricultural and urbanized. In fact, urbanized areas and areas at the crop-forested interface might hold higher raccoon population densities as compared to other areas [2]. There have been land-use studies to show how this ecological phenomenon might influence raccoon rabies cases. The main problem with these studies is the bias associated with testing of raccoons in higher population centers [3,4]. The only raccoons tested by public health department in Georgia are those that have contact with humans or domesticated animals, such as dogs and cats; there would be more cases where there is more testing. This type of surveillance is considered passive and the bias associated with it makes it difficult to analyze how land-use patterns may actually influence higher rates of raccoon rabies. It is proposed that by using GIS clustering analysis, we can show how to mitigate this bias through the addition of a standardizing variable when formulating land-use models to analyze positive cases of rabies in wildlife reservoirs.

Fig. 1:

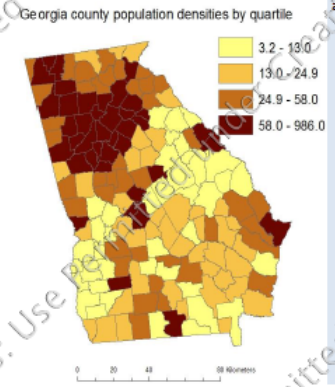


Figure 2: Clustering of positive cases

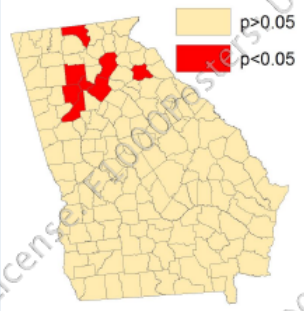


Figure 3: Clustering of positive cases / pop density

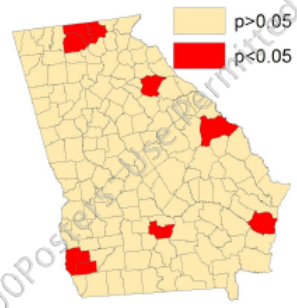
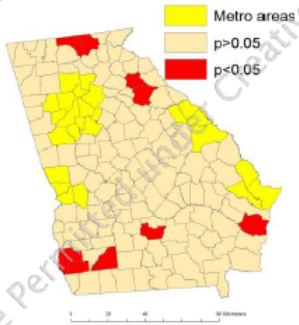


Figure 4: Clustering of submissions / pop density



Results and Discussion

Figure 1 shows the quartile population densities of 159 Georgia counties. Figure 2 shows that the significant clustering of positive cases occurs mostly in the Atlanta metro area and exurbs as indicated by the large upper quartile grouping of counties in the central upper part of the state in Figure1. When the number of positive cases is put at a rate of population density (Fig 3) the clustering disperses away from the metro areas. Because our model counted number of positive cases as the dependent variable , we wanted to use some form of the submissions (positive + negative) data as the "weighted" variable on the right side of the regression model to standardize the counties. Therefore , figure 4 shows the clustering of submissions as a rate of population density and closely mimics the results from figure 3. A final negative binomial regression model included: the standardizing variable (+1.88; p<0.001), evergreen forest (-1.77; p<0.02), commercial (-52.2; p<0.001), low intensity residential (+11.49; p<0.001), and barren (+43.53; p=0.019). Because the weighted variable had a range from 0 to 1. 66 and the high density counties had relatively low values, it seems that it gave more credibility to our land-use pattern findings. The land-use findings have been supported by our understanding of raccoon rabies ecology in the literature and therefore have implications for the enzootic areas along an ORV zone. Raccoons may use evergreen forest as pass-through but their poor resource availability tampers their use as habitat [5]. Managed pine forests in western and southern Alabama have been attributed as being the major barrier to the spread of the raccoon enzootic further west into Mississippi [6]. This study offers the possibility of utilizing them as semi-permeable barriers in the ORV programs. Baits that might have been distributed in a pure stand of upland evergreen forest could be concentrated at the edge or distributed elsewhere at no loss in control effort. Improvements to the public health database that reports submissions at a finer geographic resolution, such as zip code or census tract, might or might not support these findings.

Methods

Raccoon rabies testing data comes from the Georgia Department of Public Health from 2006 through 2010 and is reported at the county level of resolution. This data was added into the shapefile attributes table of Georgia counties that is downloaded from the Atlanta Regional Commission. U.S. Census Bureau 2010 population and land area data was also entered into the attributes table. Thirteen land use variables were extracted by county from the USGS National Land Cover Database 2006 and each calculated as a percentage. Using polygon pattern analysis, the local G-statistic, maps were generated that show clustering of positive cases, clustering of positive cases per person per square kilometer, and submissions (positive + negative) per person per square kilometer. Using SAS and accounting for autocorrelation, we ran a stepwise backwards negative binomial regression of variables that had significant crude odds ratios.

[1] Institute of Public Health, GA State University, Atlanta, GA; [2] Poxvirus and Rabies Branch, CDC, Atlanta, GA; [3] Georgia Dept of Public Health, Atlanta, GA

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The National Quitline Data Warehouse: Development, Implementation, Utilization, and Dissemination*

[1]Henraya McGruder, [1]Lei Zhang, [2]Nathan Mann, [1]Marti Engstrom, and [1]Ann Malarcher
[1]Centers for Disease Control and Prevention, [2]Research Triangle Institute, Research Triangle Park, NC

Overview

- National Quitline Data Warehouse (NQDW)
  - Goals, Utility, and Types of Data
  - 2010 – 2011 NQDW Data
  - Data Dissemination plans

Goals of NQDW

- To serve as a continuing national resource for data on the services, utilization, and success of US state quitlines (50 states + DC, Guam and Puerto Rico) for use in monitoring, evaluation, and improvement
  - Assist in the evaluation of quitline activities under Component III of the Communities Putting Prevention to Work (CPPW) Initiative, authorized by the American Recovery and Reinvestment Act (ARRA) of 2009
  - Assist in the evaluation of quitline activities under Public Prevention Health Fund (ACA) funding
  - Assist in the evaluation of the National Tobacco Education Campaign

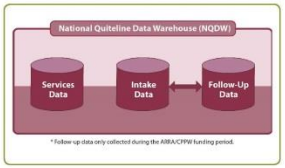
Utility of NQDW

- The ability to track changes over time, nationally and state-by-state.
- Improve understanding and utilization of individual-level quitline data.
- Facilitate reporting to policy makers such as the HHS Secretary and Congress
- Examination of utilization trends among priority populations

Utility of NQDW (continued)

- Compare single state to national data
- Answer questions on quitlines that a single state can not answer
- Enhanced accountability
- Obtain data for evaluation and program improvement
- Promote the development of 'best practices.'
- Help Office of Smoking and Health improve its technical assistance to states

Structure of NQDW

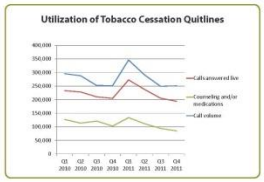


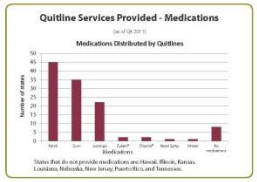
CDC-OSH's Role in the NQDW

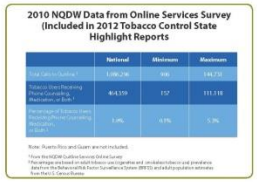
- Provide technical assistance and training to states related to data collection and reporting of:
  - Online Services Survey,
  - Intake survey,
  - 7-month follow-up survey
- Aggregate the data at the state-level and national level
- Report aggregate state-level data in the State Tobacco Activities Tracking and Evaluation (STATE) System and other publications, e.g., State Tobacco Control Highlights

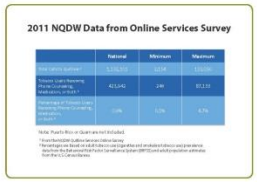
NQDW Data Received

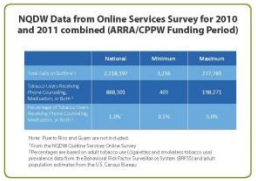
- NQDW Quitline Services Online Survey
  - Received data from all 53 states/territories for all quarters (100% completion rate)
- NQDW Intake Questionnaire
  - Received date from 52 out of 53 states/ territories for all quarters (98% completion rate)
- NQDW 7-Month Follow-up Questionnaire
  - Received data from 49 out of 53 states/ territories for reporting period (92% completion rate)

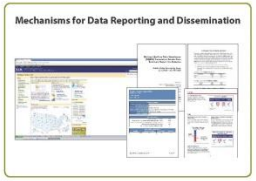












NQDW Data Dissemination

- NQDW Project Reports to states
  - NQDW Cumulative Services Data and Intake Frequency Reports
- Data Disk to states containing:
  - Data files that each state submitted,
  - Programs used to work with the state's data,
  - Formatted data files that we created, and
  - Reports that we prepared and returned to states
- STATE System
- *Tobacco Control State Highlights 2012* (to be released December 2012)
- *MMWRs*

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CS234227

Treatment Completion Rates for 12 weekly Doses of Isoniazid plus Rifapentine for Treatment of Latent Tuberculosis Infection in Programmatic Settings in the United States

Nwabunie Nwana[1], Amy Sandul[1], Sapna Morris[1], Christine Ho[1], Suzanne Marks[1], Ruth Moro[1], and the 3HP Post-Marketing Group

[1]Division of Tuberculosis Elimination, Centers for Disease Control and Prevention, Atlanta, GA

BACKGROUND

- Approximately 5-10% of persons infected with *Mycobacterium bacilli*, a condition known as Latent Tuberculosis Infection (LTBI), will eventually develop active tuberculosis (TB) disease.
- Treatment of persons with LTBI prevents progression to TB disease, and is an important cornerstone in the United States strategy for TB elimination.
- The effectiveness of the current standard LTBI regimen consisting of isoniazid for 9 months (9H) is limited by low rates of treatment completion (67% in 2011)[a].
- A recent clinical trial of LTBI treatment with 12 weekly, directly observed doses of isoniazid and rifapentine (INH-RPT) demonstrated non-inferiority compared with the standard 9H regimen.
- Subsequently, CDC published guidelines for use of INH-RPT for treatment of LTBI[b].

OBJECTIVE

- To describe treatment completion rates and associated characteristics for patients receiving INH-RPT for LTBI treatment.
- To describe reasons for non-completion of treatment.

[a]Aggregate Reports for Tuberculosis Program Evaluation 2011
[b]http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6048a3.htm

METHODS

- A prospective observational cohort of patients diagnosed with LTBI was offered treatment with INH-RPT between July 1, 2011, and December 31, 2013, in accordance with CDC guidelines.
- Patients were determined to be ineligible to complete INH-RPT treatment if they were HIV-infected on anti-retroviral treatment, contacts to a TB patient having drug-resistant TB disease, diagnosed with active TB, or had a negative quantiferon (QFT) test result.
- 16 sites, comprised of Federal, State and local TB programs, collaborated with CDC to assess treatment outcomes and adverse events (AE) of patients starting treatment
- Sites worked with CDC to develop patient-care data collection forms. Basic demographic information, country of birth, incarceration status, housing status, dose and associated symptoms were collected from all eligible patients (3307) receiving directly-observed INH-RPT. Treatment completion was defined as receipt of at least 11 of 12 doses of INH-RPT over 16 weeks.
- Data were entered into a Microsoft Access database and analyzed using SAS 9.3
- We conducted descriptive analyses and report relative risk (RR) associations with treatment completion and their 95% confidence intervals (CI).

Figure 1. Flowchart of Patients

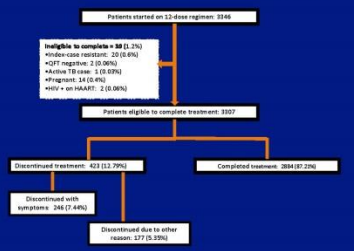


Table 1. Characteristics of patients treated with and completing INH-RPT regimen

Characteristic	Number Eligible to Complete (N=3307)	Completed Treatment (N=2884) (%)	RR (95% CI)
Gender			
Male	1768	1557 (88.1)	1.02(0.99-1.05)
Female	1539	1327 (86.2)	Reference
Median age, years[IQR]	36 years[IQR 26-50]	36 years[IQR 26-50]	
Age Categories (years)			
(2-11)[a]	167	159 (94.6)	1.09(1.05-1.13)
(16-30)	1037	924 (89.1)	1.03(1.00-1.06)
(31-44)	957	837 (87.5)	1.00(0.96-1.03)
(45-64)	945	807 (85.4)	0.97(0.94-1.00)
>=65[a]	201	158 (78.6)	0.90(0.83-0.96)
Race/Ethnicity			
Hispanic[a]	754	685 (90.9)	1.06(1.03-1.08)
Non-Hispanic White[a]	543	502 (92.5)	0.93(0.90-0.97)
Non-Hispanic Black	1206	1038 (86.0)	0.99(0.96-1.02)
Non-Hispanic Asian	729	664 (89.1)	1.03(0.99-1.06)
Non-Hispanic Other	74	57 (90.5)	1.04(0.96-1.12)
Subpopulation Categories[c]			
Contact[a]	827	759 (91.4)	1.07(1.04-1.09)
Convertor[a]	696	675 (93.0)	0.95(0.92-0.98)
Convertors < 1yr[a]	519	459 (87.3)	1.00(0.97-1.04)
Homeless< 1yr[a]	181	147 (81.2)	0.93(0.89-0.98)
Foreign born[a]	1297	1171 (90.3)	1.06(1.03-1.09)
Refugee	132	113 (85.6)	0.98(0.91-1.05)
Health Care Worker[a]	582	493 (83.3)	0.95(0.91-0.99)
Student	130	123 (94.6)	1.09(1.04-1.14)
Employment	213	181 (85.0)	0.97(0.92-1.02)

Definition of abbreviations: CI= confidence interval; RR= relative risk.
[a]Category values do not sum to 3307 because categories listed are not mutually exclusive.
[b]Within 12 months of starting treatment.
[c]Comparison group for each characteristic are those without the characteristic.
[d]Indicate characteristic that have statistically significant RR; that is, CI does not contain the null value of 1

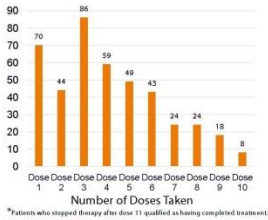
RESULTS

- As of December 31st 2013, 3346 patients started the regimen and 3307 were eligible to complete. The overall treatment completion rate was 87% (2,884/3,307) (Figure 1).
- Among patients starting treatment, 13% (423/3307) discontinued, and 7% (246/3307) discontinued due to an AE attributed to the regimen (Figure 1). Among those stopping treatment, the median dose of stopping was three (of 12) (Figure 3).
- Completion rates varied by subpopulation categories but exceeded 80% for all groups (range 81%– 95%). The highest completion rates were achieved with students (95%) and recent contacts to active TB cases (91%) (Table 1).
- Across all 16 participating project sites, treatment completion rates exceeded 80% (Range 81%-100%). (Figure 2).
- There were no reported deaths attributable to INH-RPT.

Figure 2. Treatment completion rate by participating site

* Each treatment completion rate represents the proportion of those completing treatment among those eligible to complete treatment at that site

Figure 3. Among those stopping treatment- dose associated with discontinuation of treatment



*Patients who stopped therapy after dose 11 qualified as having completed treatment.
*Percentage values represent the proportion of patients who stopped treatment at that dose, where n=423.

Table 2. Reasons for stopping INH-RPT treatment

Reasons for Stopping Treatment	N=423 (%)
Adverse Event	246 (58.2)
Lost to follow-up	75 (17.8)
Refused Treatment	47 (11.1)
Moved	19 (4.5)
Other	36 (8.5)

CONCLUSION

- Across diverse TB programmatic settings, high rates of completion were achieved with the 12-weekly directly observed INH-RPT regimen.
- Treatment completion in this project was high in special populations (homeless and corrections) that historically have had high rates of loss-to-follow up.
- Treatment discontinuation rates attributed to adverse events were low.

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Use of Three Months of Isoniazid and Rifapentine for Latent Tuberculosis Infection (LTBI) among Homeless Persons in United States (U.S.) Programmatic Settings

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BACKGROUND

- Persons experiencing homelessness remain a high risk population for Tuberculosis (TB) morbidity and mortality. In fact, TB outbreaks have frequently originated in homeless shelters.
- Targeted screening and successful treatment of homeless persons with latent tuberculosis infection (LTBI) prevents progression to TB disease and is an important strategy used to contain TB outbreaks in shelters.
- Unfortunately, the effectiveness of the current standard LTBI regimen consisting of isoniazid for 9 months (9H) is limited by low patient adherence resulting in low treatment completion rates (<50%).
- A new shorter course and non-inferior treatment consisting of once weekly, 12-dose, directly observed regimen of isoniazid and rifapentine (INH-RPT) achieved higher completion rates in a recent clinical trial*.

OBJECTIVE

- To describe treatment completion rates and associated characteristics of homeless persons receiving INH-RPT for LTBI treatment in programmatic settings.

* Sterling TR, Villarino ME, Borisov AS, et al. Three months of rifapentine and isoniazid for latent tuberculosis infection. *The New England journal of medicine*. Dec 8 2011; 365 (23): 2155-2166.

METHODS

- Prospective observational data was obtained from 3346 persons diagnosed with LTBI and offered treatment with INH-RPT between July 1, 2011, and December 31, 2013, in accordance with CDC guidelines.
- Patients were determined to be ineligible to complete INH-RPT treatment if they were HIV-infected on anti-retroviral treatment, contacts to a TB patient having drug-resistant TB disease, diagnosed with active TB, or had a negative quantiferon (QFT) test result.
- 2400 persons provided information on medical and socio-behavioral risk factors, including housing status in the prior 12 months, and were eligible to be treated with 12-doses of INH-RPT.
- Data were entered into a Microsoft Access database and analyzed using SAS 9.3.
- Treatment completion was defined as receipt of at least 11 of 12 doses of INH-RPT over 16 weeks.
- We conducted descriptive analyses and compared treatment completion rates between homeless and stably housed persons.
- Bivariate and multivariate relative risks (RR, ARR) are reported with 95% confidence intervals (CI).

Figure 1. Flowchart of patients

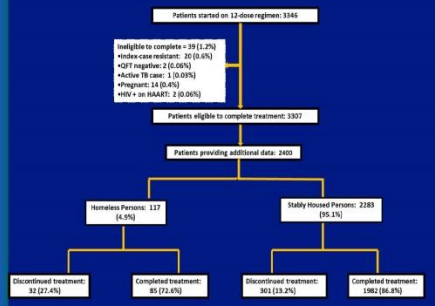
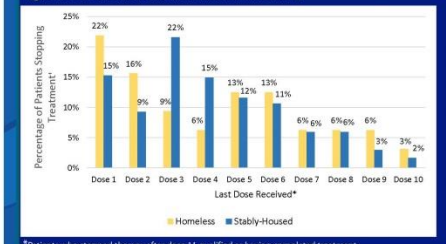


Figure 2. Dose associated with discontinuation of treatment



*Patients who stopped therapy after dose 11 qualified as having completed treatment.
*Percentage values represent the proportion of patients who stopped treatment at that dose, where n=32 for homeless persons and n=301 for stably-housed persons.

Table 1. Comparison of treatment discontinuation rates between homeless and stably-housed persons by patient characteristics

Characteristic	N=2400 (%)	Proportion of homeless persons not completing treatment (%)	Proportion of stably-housed persons not completing treatment (%)	RR[2] (95% CI)
Gender				
Male[3]	1242 (51.7)	25	12	2.1 (1.4-3.1)
Female[3]	1158 (48.3)	33	14	2.4 (1.4-4.0)
Median age, years [IQR]	37 years [IQR: 26-51]	47 years [IQR: 34-56]	37 years [IQR: 26-51]	
Age Categories (years)				
(2-17)	100 (4.2)	--	8	--
(18-30)[3]	757 (31.5)	39	10	3.9 (2.1-7.3)
(31-64)[3]	660 (27.5)	31	13	2.4 (1.4-4.1)
(47-64)	714 (29.8)	19	13	1.5 (0.7-2.2)
>=65[3]	169 (7.0)	75	23	3.3 (1.7-6.1)
Race/Ethnicity[4]				
Hispanic[3]	471 (19.7)	38	10	3.8 (1.5-9.6)
White	980 (38.3)	28	19	1.5 (0.7-3.1)
Black[3]	844 (35.2)	25	13	2.0 (1.3-3.0)
Asian	429 (17.9)	--	11	--
Other[3]	58 (2.4)	67	6	12.2 (3.1-47.6)
Subpopulation Categories[4]				
Contact	628 (26.2)	19	8	2.3 (0.8-6.6)
Converter	676 (28.2)	18	17	1.1 (0.3-3.9)
Convertion < 1yr*	234 (9.8)	18	18	1.0 (0.3-2.8)
Foreign-born[3]	830 (34.6)	80	10	8.2 (5.0-13.2)
Refugee[3]	20 (0.8)	100	16	6.3 (2.2-17.9)
Health Care Worker[3]	478 (19.9)	100	16	6.4 (5.2-7.8)
Student	120 (5.3)	--	5	--
Employment	209 (8.7)	25	15	1.7 (0.3-9.6)
Medical Conditions[4]				
Diabetes	177 (7.4)	86	84	0.9 (0.1-5.5)
Chronic Renal Disease	30 (1.3)	--	20	--
Immunocompromised[5]	91 (3.8)	--	11	--
Hepatitis	59 (2.5)	40	20	2.0 (0.6-6.5)
Chronic Lung Disease	78 (3.3)	50	23	2.2 (0.8-6.3)
Mental Health Problems	127 (5.3)	29	21	1.4 (0.6-3.2)
Hypertension	305 (12.7)	25	13	1.9 (0.9-3.8)
Behavioral Risk Factor[4]				
Alcoholism	211 (8.8)	17	17	1.0 (0.5-2.3)
Current or Past Smoker	537 (22.4)	27	18	1.5 (1.0-2.4)
IDU Drug Use	22 (0.9)	33	17	2.0 (0.4-9.3)
Non-IDU Drug Use	157 (6.5)	27	16	1.7 (0.8-3.5)
Final Disposition				
Stopped Treatment[4]	333 (13.9)	27	13	2.1 (1.5-2.8)
Stopped due to Adverse Event	203 (8.5)	9	8	1.1 (0.6-2.0)
Stopped due to Lost to Follow-up[6]	48 (2.0)	13	2	8.9 (5.0-15.9)
Stopped due to Other Reasons[7]	95 (4.0)	8	4	2.0 (1.1-4.0)

Definition of abbreviations: CI= confidence interval; RR= relative risk.
* TNC= Number of persons not completing treatment.
[#] Category values do not sum to 2400: Race/Ethnicity category has frequency missing =6; Patient characteristics under Subpopulation, medical and behavioral risk categories are not mutually exclusive.
*Within 12 months of starting treatment.
[5] Includes HIV positive persons
[2] Comparison group for each characteristic are those without the characteristic.
[3] Indicate characteristic that have statistically significant RR, that is, CI does not contain the null value of 1

RESULTS

- Among 2400 persons starting treatment, 117 (4.9%) were homeless.
- Of these homeless persons starting treatment, 74% (87/117) were male. Median age of this sub-population was 47 years (IQR: 34, 56).
- Sixteen (14%) were contacts to active TB cases, 17 (15%) had been in a correctional facility within the past year, 5 (4%) were foreign-born, and 11 (9%) were recent converters.
- Frequent socio-medical conditions reported in this sub-population were smoking (60%), alcoholism (30%), and hypertension (24%).
- The stopped-treatment rate was 27% (32/117) in homeless compared to 13% (301/2283) in stably-housed persons (RR= 2.07, 95% CI= 1.52-2.84; ARR=1.85, 95% CI= 1.33-2.56).
- There was no significant difference in the treatment discontinuation rate as a result of an adverse event between the homeless (9%= 11/117) and stably-housed (8%= 192/2283) persons (RR= 1.12, 95% CI= 0.63-1.99).
- Homeless persons were 9 times more likely to stop treatment as a result of being lost to follow-up compared to stably-housed persons (RR= 8.87, 95% CI= 4.96-15.86).
- The median dose at which treatment was stopped among homeless persons was the third dose (IQR: 2, 6), compared to the fourth dose (IQR: 3, 6) among stably-housed persons.

CONCLUSION

- The use of directly observed INH-RPT to treat LTBI resulted in a high rate (73%) of treatment completion among homeless persons.
- However, homeless persons were significantly more likely to stop treatment than stably-housed persons.
- TB programs should prioritize efforts and target resources in this subpopulation during treatment so as to optimize completion of treatment.

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Safety and Tolerability of 12 Weekly Doses of Isoniazid and Rifapentine for Treatment of Latent Tuberculosis Infection in Programmatic Settings in the United States

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Background

- Treatment of latent tuberculosis infection (LTBI) in high-risk populations is an important strategy for tuberculosis (TB) prevention and elimination in the United States (U.S.).[1]
- Systemic drug reactions were associated with the 12-dose LTBI regimen of once-weekly isoniazid (900 mg) plus rifapentine (900 mg) (INH-RPT) in a large clinical trial, "PREVENT TB".[2,3]

Objective

- To assess safety and tolerability of directly observed INH-RPT in the U.S. as part of a national post-marketing surveillance activity.

Methods

- Data were collected from an observational prospective cohort during July 1, 2011 - December 31,2013 using standardized review instruments.
- INH-RPT administered by directly observed therapy (DOT) was started in 3,307 persons with LTBI from 16 U.S. sites following CDC guidelines and local program practices.
- Patients were instructed to report symptoms during treatment at each DOT visit.
- Rates for treatment discontinuation were calculated.
- We assessed the association of development of symptoms with treatment completion by univariate analysis.

Affiliations

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2 CDC Foundation, Research Collaboration, Atlanta, GA
3 The University of Mississippi, Medical Center, Jackson, MS
4 Mississippi State Department of Health
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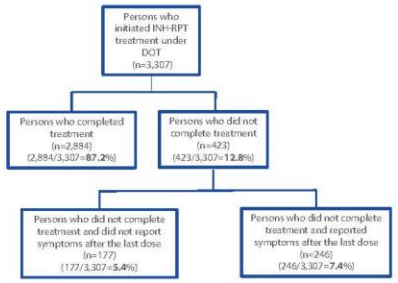
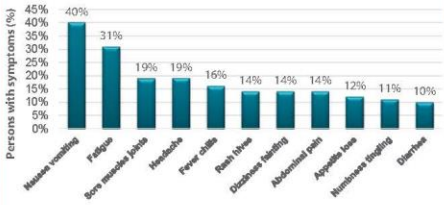
6 The Ohio State University Medical Center, Columbus, OH

INH-RPT Treatment Under DOT in the U.S. Post-marketing Surveillance Activity



Frequency of Symptoms During the Administration of INH-RPT Treatment Regardless of Discontinuation of Treatment (n=1,207)



Symptoms developed during INH-RPT treatment

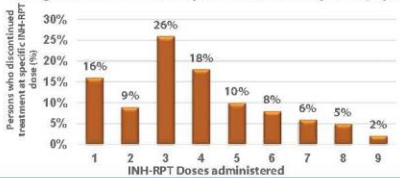
List of symptoms solicited at each visit, except for headache, which was self-reported

Univariate Analysis of Demographic Characteristics in Persons who did not Complete INH-RPT Treatment, by Report of Symptoms (n=423)

Characteristics	Did not complete treatment (n=423)		OR (95% Confidence Interval)	P-value
	Persons who did not report symptoms after the last dose (n=177) n (%)*	Persons who reported symptoms after the last dose (n=246) n (%)*		
Gender				
Male (n=1,768) ref	111 (6.3)	100 (5.7)	ref	ref
Female (n=1,539)	66 (4.3)	146 (9.5)	**2.46 (1.65, 3.65)**	**<.0001**
Age groups (years)				
2-17 (n=167) ref	4 (2.4)	5 (3.0)	ref	ref
18-30 (n=1,037)	57 (5.5)	56 (5.4)	0.79 (0.20, 3.08)	0.73
31-44 (n=957)	55 (5.7)	65 (6.8)	0.95 (0.24, 3.70)	0.94
45-64 (n=945)	51 (5.4)	87 (9.2)	1.37 (0.35, 5.31)	0.65
>=65 (n=201)	10 (5.0)	33 (16.4)	2.64 (0.59, 11.75)	0.20
Race/Ethnicity **				
Hispanic (n=754) ref	31 (4.2)	38 (5.0)	ref	ref
Non-Hispanic White (n=543)	36 (4.9)	91 (12.5)	**2.1 (1.12, 3.8)**	**0.02**
Non-Hispanic Black (n=1,200)	81 (6.7)	80 (6.7)	0.81 (0.46, 1.42)	0.45
Non-Hispanic Asian (n=729)	25 (4.6)	34 (6.3)	1.11 (0.55, 2.24)	0.77
Non-Hispanic Other (n=74)	4 (5.4)	3 (4.1)	0.61 (0.13, 2.94)	0.54
Special populations				
Contact of a TB case (n=827)	27 (3.3)	44 (5.3)	1.21 (0.72, 2.04)	0.48
Corrective (n=809)	36 (4.4)	95 (11.8)	**2.46 (1.56, 3.85)**	**<.0001**
Incarceration (n=519)	43 (8.3)	23 (4.4)	**0.32 (0.19, 0.56)**	**<.0001**
Homeless (n=181)	23 (12.7)	11 (6.1)	**0.26 (0.11, 0.61)**	**0.002**
Foreign-born (n=1,297)	56 (4.3)	70 (5.4)	0.85 (0.56, 1.31)	0.48
Refugee (n=132)	6 (4.5)	13 (9.9)	1.59 (0.59, 4.27)	0.36
Health Care Worker (n=502)	30 (5.9)	54 (10.8)	1.38 (0.84, 2.26)	0.20
Student (n=130)	5 (3.9)	2 (1.5)	0.28 (0.05, 1.47)	0.13

*Percentages of total persons for each characteristic **7 missing values

INH-RPT Dose After Which Persons Discontinued Treatment, Among Persons who did not Complete Treatment and Reported Symptoms



Results

- Among 3,307 persons who received INH-RPT, 54% were male, 37% black, and 0.8% were infected with HIV. The median age was 36 years.
- The overall treatment discontinuation rate was 12.8% (423/3,307) and the rate of treatment discontinuation among participants who reported symptoms was **7.4%** (246/3,307).
- The proportion of persons who reported symptoms and were female or white non-Hispanic were higher than those who did not report symptoms (p-value = <.0001 and 0.02, respectively, see table).
- A total of 1,207 (36.5%) persons reported at least 1 symptom after one of the first 10 doses. Nausea vomiting (40%), fatigue (31%), sore muscle joins (19%), headache (19%), fever/chills (16%) were the most frequently reported symptoms.
- INH-RPT Dose 3 was the most frequent dose after which treatment was discontinued (26%), among persons who did not complete treatment and reported symptoms.
- The odds of not completing treatment were 4.5 times higher for those reporting at least one symptom, compared to those who did not report any symptoms after one of the first 10 doses (95% CI: 3.6, 5.6).
- No deaths or permanent sequelae attributed to INH-RPT were reported.

Conclusions

- Findings in this programmatic surveillance activity were very similar to those reported in the PREVENTTB trial.
- INH-RPT administered by DOT for LTBI treatment in programmatic settings was well tolerated and safe.

Acknowledgement

Post-implementation 12-Dose INH-RPT Assessment Project Group

References

(1) Centers for Disease Control and Prevention. Controlling tuberculosis in the United States recommendations from the American Thoracic Society, CDC, and the Infectious Diseases Society of America. *MMWR Morb Mortal Wkly Rep* 2005;54 (No.RR-12):[1-69].
(2) Sterling TR, Villarino ME, Borisov AS, et al. Three months of rifapentine and isoniazid for latent tuberculosis infection. *The New England Journal of Medicine*. Dec 8 2011;365(23):2155-2166.
(3) Timothy R. Sterling, Ruth N. Moro, Andrey S. Borisov, et al. Flu-like and Other Systemic Drug Reactions Among Persons Receiving Weekly Rifapentine plus Isoniazid or Daily Isoniazid for Treatment Tuberculosis Infection in the PREVENT TB Study. http://cid.oxfordjournals.org/content/early/2015/04/21/cid.civ323.full.pdf+html

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National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention
Division of TB Elimination

Some Resources

Some Resources

- “Designing Conference Posters” (http://colinpurrington.com/tips/poster-design)
- “Creating Effective Poster Presentations” (https://www.ncsu.edu/project/posters/index.html)
- “Tips for Designing Better Research Posters” (https://old.elsevier.com/connect/infographic-tips-for-designing-better-research-posters) (infographic)
- “Better Posters: A Resource for Improving Poster Presentations” (http://betterposters.blogspot.com/) (blog containing poster critiques)

Questions and Answers

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