FINAL PRESENTATION AND ELEVATOR SPEECH COMPETITION

Poster session will feature 14 research projects
All summer fellows will compete in the 90-second elevator speech for prizes in the category of Best Speech & People's Choice

Friday August 12, 2016
Poster Presentation/ Elevator Speech:
10 a.m. – 12:30 p.m.
Reuel A. Stallones Building
RAS E- 101(Auditorium)
1200 Pressler St., Houston, TX 77030

Visit http://go.uth.edu/CPRIT-summer or email CPRITsummer@uth.tmc.edu
Adaptation of a community health worker-delivered education session to increase breast and cervical cancer screening and HPV vaccination for Latinas

Alma Almanza • Lara Savas, PhD • Emily Aldpavar, MPH

Methods

Lack of knowledge about recommended screening

The findings and conclusions in this poster are those of the author(s) and do not necessarily represent the official position of the funding agency.

Lack of transportation

Many barriers to screening include:

- Under- or uninsured/cost of exams
- Different language
- Lack of transportation
- Lack of child-care services
- No time/too busy
- Lack of knowledge about recommended guidelines

My Aim: Adapt the education component of a culturally targeted program (Cultivando la Salud), originally developed for farmworker Latinas in rural settings to address barriers for Latinas in an urban setting

Adaptation Objective

1. Adapt education component from one-on-one to group education sessions
2. Use Intervention Mapping to identify determinants for behavior change objectives.
3. Develop specific theory-informed education methods and strategies for Latina women based on determinants for each change objective.
4. Revise developed education materials based on feedback from promotoras in the community.

Program Adaptation Approach, Guided by IM Program Planning Framework

Step 1: Needs Assessment
Step 2: Develop matrices for behavior objectives and determinants
Step 3: Develop theory-based intervention methods and practical applications
Step 4: Create intervention program and modify as needed
Step 5: Create plan for adoption and implementation
Step 6: Create evaluation plan

- I created the following in order to develop theory-based methods for intervention’s change objectives:
  a) Completed a Literature Review
     - Organized literature to help identify theoretical methods that could be used to address adaptation determinants
     - **Innovation Tool: alternatives, possibilities, choices**
  b) Matrices for Adaptation
     - Tracked specific determinants for each performance objective
     - Identified new methods and strategies to incorporate in education component but that still address same objective changes
     - Due to change from flipchart and video to PowerPoint
     - **Innovation Tool: thinking backwards**

Methods (cont.)

- I assisted in revising the education component from a flip-chart session and video *fotonovela* to a PowerPoint presentation.

  **Innovation Tool**

  - **Myst or Fact**
    - Replace conversations in the original CLS program video that clarify some common myths (misbeliefs) or worries
    - **Innovation Tool: framing**

  - **Testimonial Video**
    - Address screening determinants related to screening, such as:
      - **Importance of early detection**
      - **Belief that other Latina women obtain screening**
      - **Express benefits of knowing results**
      - **Belief that treatment can be effective**
      - **Innovation Tool: flip concept**

Next Steps

- Continue to gather input and feedback from promotoras on adapted materials and Program Delivery Protocol Manuals
- Adapt promotoras delivery training to ensure program is delivered as planned
- Pilot test new adapted education component with Latina women from the community in order to guided future revisions as needed

Acknowledgements: UTHealth Innovation for Cancer Prevention Research Training Program Summer Undergraduate Fellowship (Cancer Prevention and Research Institute of Texas grant RP1# is 160015) & A community based program to increase breast and cervical cancer screening and HPV vaccination to reduce impact of breast and cervical cancer among Latinas (CPRIT PP# is 160047). The findings and conclusions in this poster are those of the author(s) and do not necessarily represent the official position of the funding agency.
Designing a Provider Audit and Feedback Intervention to Increase HPV Vaccination in Harris and Jefferson Counties

Andrea Amaro ♦ Lara Savas, PhD ♦ Melanie Thiel, MPH ♦ Maria Fernandez, PhD

The University of Texas School of Public Health, Houston, TX

Introduction

- **Background**: Multiple interventions, including systems-level and patient education, are being used in a network of Federally Qualified Health Centers (FQHC) to combat low rates of HPV vaccination. Audit and feedback (A&F) has been proven to be effective in changing provider behavior and it has recently been applied to HPV vaccination. Yet, what constitutes A&F has been inconsistent across studies and does not meet the needs of this FQHC network.

- **Aims**: Develop an A&F system that can be tracked and sustained by FQHC network.

Methods

- Constructed evidence table of past A&F research to extract information on how each study conducted its A&F system depending on size and type of practice.
- Discovered discrepancies in what was considered feedback.
- Discussed concerns of time efficiency and work distribution with FQHC network program administrators.
- Reviewed prior project documents and drafts to determine what information is being communicated to providers and staff and what data informatics are feasible.
- Consolidated methods used by other large primary practice networks to develop a comprehensive system that will be the most effective and utilize the least amount of time.

Audit and Feedback System

- Feedback quarterly meetings address clinic performance and review strategies to increase HPV vaccine initiation.
- Peer discussion is supported and providers are asked to come up with their own plan of action and goals for the upcoming quarter.
- Time is conserved by employing group feedback and individual feedback only for struggling providers.
- Delivery of audit and feedback is tracked by checklist during group feedback meeting.

Next Steps

- Audit and feedback for Cluster A providers estimated to begin at the end of August.
- Translation of this system to other cluster A providers will be the focus of a future grant proposal by FQHC network.

Innovation

- Developed an A&F system that can be tracked and sustained by FQHC network.
- Consistent with the needs of the study population.
- Consistent with the needs of the FQHC network administrators.
- Consistent with the needs of the providers.

Acknowledgements: UTHealth Innovation for Cancer Prevention Research Training Program Summer Undergraduate Fellowship (Cancer Prevention and Research Institute of Texas grant # RP160015). Increasing HPV Vaccinations in Harris and Jefferson Counties Using Combined Evidence-Based Approaches in a Federally Qualified Health Center (Cancer Prevention and Research Institute of Texas grant # PP140208). The findings and conclusions in this poster are those of the author(s) and do not necessarily represent the official position of the National Cancer Institute.
Characterizing Social and Environmental Exposures of Latino Day Laborer Corners

Jihyun Byun, Maria E. Fernandez-Esquer, PhD
University of Texas at Austin, UTHealth Center for Health Promotion & Prevention Research

**Background:** Latino Day Laborers (LDLs) have the highest injury and mortality rate among any working group in the United States. To look for work, LDLs gather in locations called “corners”, where they stand outside for hours every day. Over 40 corners have been identified in Houston.

**Fig. 1 – A corner in west Houston**

Although LDLs engage in high-risk, labor-intensive jobs such as landscaping and construction, the corners are harsh environments; they are often located right next to major roadways and offer no shade or places to sit.

**My Aim:** Characterize social and environmental risks that LDLs face at the corners.

**INTRODUCTION**

Fig. 2. Crime Rates

Many of the corners were in neighborhoods with relatively high crime rates, contributing to the social risks that the LDLs face as they wait for work.

Fig. 3. Map of pollutants.

Several of the corners, especially those close to the city’s center, were located within areas that exceeded EPA standards for pollutants such as particulate matter (PM$_{2.5}$), carbon monoxide (CO), and nitrogen dioxide (NO$_2$), which harm cardiovascular and respiratory health.

Fig. 4. Aggregated map

The social and environmental exposures were combined to form an index representative of each corner’s risk to an LDL’s health to identify the “best” and “worst” corners.

**METHODS**

The corners were mapped using a geographic information system (GIS), which allowed for clear spatial visualization of the corners. Publicly available data from satellite/aerial maps, government agencies such as the Houston Police Department and the EPA, and survey results were utilized to study the following variables for the corners:

- **Environmental Factors**
  - Sun Exposure / Availability of Shade at Corners
  - Noise Pollution
  - Air Pollution (PM$_{2.5}$, CO, NO$_2$)

- **Social Factors**
  - Crime rates within a 1 mi. radius of corners (violent crime, property crime, and quality of life crime)
  - Depression rates among LDLs
  - Injury rates among LDLs

- **Demographics**
  - Average Household Income
  - Racial makeup of neighborhoods surrounding corners

**RESULTS**

Both the maps for individual variables and the map for the aggregated index allowed us to identify corners that face relatively elevated risks from various social and environmental exposures.

Using this data, it is my hope that intervention programs to improve the working conditions of LDLs can be tailored to meet specific needs and address risk factors prevalent in certain corners.

**ACKNOWLEDGEMENTS**

UTHealth Innovation for Cancer Prevention Research Training Program Summer Undergraduate Fellowship (Cancer Prevention, Research Institute of Texas grant RP#160015), and National Institute of Minority Health Disparities NIH R34 grant. The findings and conclusions in this poster are those of the author(s) and do not necessarily represent the official position of the funding agencies.
Effects of a Cancer Diagnosis on Employment Status

Annie Cherner
Independent Living Research Utilization at TIRR Memorial Hermann

Introduction

• More people are surviving cancer than in previous years.
• Cancer survivors are facing new challenges
• Employees with a cancer diagnosis are discriminated against in the workforce
• Face higher rates of unemployment than others in the general population.
• Increase in the number of cancer survivors who stay in the workforce
• Low levels of employees who understand their rights

Methods

• Two different surveys
  • Healthcare providers
  • Cancer survivors
• Healthcare providers came from either Memorial Hermann Healthcare System or M.D. Anderson Cancer Center
• Levels of knowledge on employment support services
• Views on the effects of cancer
• Most/Least helpful thing done by employers

Findings

According to respondents, encouragement and flexibility to take time-off were noted as the two most helpful actions carried out for them during their battle with cancer.

On the other hand, respondents said the least helpful actions were nothing and having the same expectations.

Respondents wanted more information on employment, the law, and support.

Innovation Tools

• Identify frames on how people see those with cancer
• Use groups to come up with ideas
• Create analogies on cancer survivors’ treatment

Next Steps/Implications

• Survey for young-adults on their experiences in the workplace after cancer diagnosis
• Program for healthcare professionals on how to better treat and help people with disabilities
• Factsheets for Latino people battling cancer, caregivers, and fertility issues among cancer survivors and GINA

Acknowledgements:
UTHealth Innovation for Cancer Prevention Research Training Program Summer Undergraduate Fellowship (Cancer Prevention and Research Institute of Texas grant # RP160015). The findings and conclusions in this poster are those of the author(s) and do not necessarily represent the official position of the funding agency.
Using Data from High-Throughput Screening Experiments to Predict Cancer Drug Side Effect Profiles

Kurtis Evan David¹, Trevor Cohen, MBChB, PhD²
¹The University of Texas at Austin, ²The University of Texas School of Biomedical Informatics Houston

Introduction

Background:
- Cancer cell line (CCL) screening for cancer drugs test therapeutic effects, but not for toxic side effects
- The FDA records adverse events when taking medications; these can be classified and related to the CCL screenings
- The PI wanted me to collect the FDA data and use machine learning to produce models

Aim:
- Create predictive models for side effects of cancer drugs from their screening data

Methods

Data Mining from FDA and MedDRA:
- Obtained reports from the FDA (2004-2015) and extracted events for drug set
- Using the Medical Dictionary of Regulatory Activities (MedDRA), classified event terms into 21 System Organ Classes (SOCs)

Prediction Procedure:
- Compiled Z-scores for CCL sensitivities of found drugs in FAERS
- Calculated proportional reporting ratios (PRRs) for each drug-SOC pair
- Created logistic regression models, using the Z-score sensitivities and PRRs (binarized as a positive or negative signal) for each SOC

Findings

Figure 1: Receiver Operating Characteristic (ROC) Curves for High Performing SOC Models

Figure 2: Area under the Curve (AUC) Comparison of ROC Curves of Predictive Models under LOOCV

Model Analysis:
- Used Pouillot et al's (2011) models as a baseline for improvement; Figure 2 shows a snapshot of ROC-AUCs under Leave-One-Out CV
- Mean AUC: 0.73 as opposed to Mean Pouillot AUC: 0.71
- Increased values may be attributed to low # of positive cases; Skin and Blood SOCs, however, do not have this problem but still have a strong showing (Figure 1)
- Additionally used feature selection to choose groups of CCLs whose screening data gave the most accurate predictions for each model.

Implications/next steps

By analyzing the gene mutations of chosen cell lines for the models, it may be possible to connect certain genes to the drug side effects. This would directly tie into the Precision Medicine Initiative, which would assist in personalizing healthcare for cancer patients.

Innovation

Lateral Thinking: Factored cell line type when looking at the CCLs, instead of just cancer cells.
Observation: Prominent errors in data sources, so kept a keen eye while mining data.
Frame Breaking: Use the CCL data to predict possible side effects, not just effectiveness in killing the cancer cells.

Final Contribution:
- Provided a way to filter through FDA reports, and classified 45333 events into 21 SOCs
- Developed 21 predictive models for each SOC profile

Acknowledgements: UTHealth Innovation for Cancer Prevention Research Training Program Summer Undergraduate Fellowship (Cancer Prevention and Research Institute of Texas grant # RP160015). The Combinatorial Drug Discovery Program (Cancer Prevention and Research Institute of Texas grant # RP150578). Justin Mower, BS for helping with analysis discussion. Swaroop Gantela, BS in providing resources and ideas for the data mining process. The findings and conclusions in this poster are those of the author(s) and do not necessarily represent the official position of the funding agency.
Adolescents Who Use Nutrition Labels to Make Food Choices Report Healthier Dietary Behaviors
Amier Haidar & Dr. Deanna Hoelscher

Background:
• Childhood obesity is prevalent in Texas
• Adolescents are aware of and do use nutrition labels
• Little is known about dietary behaviors associated with nutrition label use

Aim: Identify dietary behaviors associated with the use of nutrition labels

Methods:
• Study participants completed a validated, self-administered questionnaire to assess nutrition and physical activity behaviors in Texas.
• Multivariate logistical regression determined the relations between nutrition label use and dietary behaviors, adjusting for grade, gender and ethnicity.

Introduction

Findings

<table>
<thead>
<tr>
<th>Logistic Regression odds ratios for associations between covariates and dietary behaviors.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Label Use</td>
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<tr>
<td>Odds Ratio</td>
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<tr>
<td>Food Label Yes</td>
</tr>
<tr>
<td>Gender</td>
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<tr>
<td>Overweight</td>
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<tr>
<td>Obese</td>
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</tbody>
</table>

Note: Referents used were No, Boy, 8th, White/Other, and Healthy Weight; each corresponding with their particular covariate.

Implications/next steps

• Study reasons why adolescents do not use nutrition labels
• Create intervention and education programs tailored to helping adolescents use nutrition labels and increase overall nutrition knowledge
• Evaluate whether these programs affect nutrition label use.

Innovation

This is one of the first studies to look at associations between nutrition label use and dietary behaviors in adolescents
• Dissecting the problem
• Finding the right question
• Observation
• The power of groups

Acknowledgements: UTHealth Innovation in Cancer Prevention Research Training Program Summer Undergraduate Fellowship (Cancer Prevention & Research Institute of Texas grant RP#160015). The findings and conclusions in this poster are those of the authors and do not necessarily represent the official position of the funding agency. This study was funded by the Texas Dept of State Health Services with funds from the Title V Maternal & Child Health Block Grant to Texas, Centers for Disease Control and Prevention Health & Human Services Block Grant.
Engaging with Parents on HPV Vaccination in the Digital Age: Online Focus Groups

Sarah Henkel¹, Elisabeth Becker¹, Erica Lipizzi¹, Sally Vernon¹, Ross Shegog¹, Lara S. Savas¹, Katrina Polivka¹, Sharon Coan¹, C. Mary Healy³, Stanley Spinner², Carol Miller², Jarrod Eksa², Preena Loomba¹, Maria Fernandez¹
¹University of Texas at Austin, The University of Texas School of Public Health; ²Baylor College of Medicine; ³Texas Children’s Pediatrics, Houston, TX

**Introduction**

**My Aim**
- Understand parent barriers to HPV vaccination in order to develop a parent education module

**Background**
- Human papillomavirus (HPV) is a common STD that leads cancer, affecting over 38,000 people annually¹
- A 3-dose vaccine series to prevent HPV is recommended for 11-12 year olds, along with the Tdap and meningococcal vaccines²

**Overall Project Aim:** Improve HPV vaccination rates in a network of pediatric clinics in Houston, Texas through a multi-level intervention

**Target Population**
- Texas Children’s Pediatrics (TCP) is the largest general pediatric in the U.S., with 58 clinics in the Houston area
- Clinic HPV vaccination rates range from 38% to over 88%, despite ~90% of patients receiving Tdap and meningococcal vaccines

**Methods**
- Literature review of existing interventions on HPV vaccination targeted to parents
- Development of protocols for online focus groups

Acknowledgements: UTHealth Innovation for Cancer Prevention Research Training Program Summer Undergraduate Fellowship (Cancer Prevention and Research Institute of Texas grant RPP is 160015). This research is supported by: CPRIT grants PP140183 and RP150014. The findings and conclusions in this poster are those of the author(s) and do not necessarily represent the official position of the funding agencies.

**Findings: Focus Group Development**

- Investigation of qualitative health research
- Investigation of online focus groups in literature
- Collection of HPV focus group data/question
- Discussion guides developed

- Recruitment, eligibility, consent materials developed
- Online focus groups for convenience, anonymity, innovation
- Search for online focus group platforms
- Chose Skype as platform for text+talk flexibility, user familiarity

**Parent Barriers**

Existing literature suggests these areas as barriers to HPV vaccination:
- Limited knowledge of HPV and HPV vaccination
- Poor communication with health care provider
- Concerns over authority with vaccination (no school mandate, pharmaceutical industry promotion)
- Concerns over cost
- History of not seeking preventive care
- Maturity of adolescent

**Innovation**

- Looking at low vaccination rates as parent refusal, not just doctors failing to recommend vaccine
- Finding the right question by identifying appropriate parent barriers
- Considering personal experience of vaccination with the TCP clinics
- Substituting Skype for in-person focus group experience
- Reversal: asking parents to describe their ideal appointment experience
- Using research methods from other industries for focus groups
- In parent education, using an EHR patient management system to deliver health promotion content to patients
- Learning from TCP parent groups

**Next Steps**

Focus groups should be conducted in late August 2016. These results will inform the content development of educational tools in the MyChart EHR system. This education will then be implemented in select TCP clinics as part of the multi-tier intervention.

The protocols for online focus groups can be adopted by other projects working with unique populations. Comparing between the text-based chat group and the participants who video call will also inform qualitative researchers on limitations for the channel.

**Sources**

Contact Sarah Henkel with questions at sarah.e.Henkel@utexas.edu
The Interaction of SH2 Domain Proteins with Net1A in Breast Cancer Metastasis

Madeline Jones, Arzu Ulu PhD, MS, and Jeffrey A. Frost PhD
University of Texas Health Science Center at Houston, Department of Integrative Biology and Pharmacology
6431 Fannin Street, Houston, Texas 77030

Introduction

Breast cancer cell motility is increased by relocalization of the enzyme Net1A from the nucleus to the cytoplasm, and an important contributor to Net1A’s relocalization is a site called pY373 on Net1A. Frost’s lab has identified 5 proteins, called SH2 domain proteins, that bind to pY373; their aim is to determine what Net1A does and how it causes cell motility through interactions with these proteins. My aim was to purify these SH2 domain proteins and to see if they will interact with Net1A.

Methods

- Use mass spectrometry to find out which phosphorylation sites contribute to Net1A’s relocalization
- Run a SH2 domain protein array to screen for proteins that bind to pY373
- Elute the plasmid from DH5α bacteria using Miniprep and then transform into BL21-A1 E. coli.
- Purify these proteins from E. coli using glutathione agarose beads for a GST-pulldown assay to see whether they will bind to full-length Net1A.

Findings

- Western Blot: The figure shows the success of the GST-pull-down assay through the use of antibodies to detect the presence of Net1A, Src and GST (GST-labeled Abl1).

Innovation Tools

- Used in problem-solving issues during experiments, such as looking at different elements within the protocol
- Collaborating with coworkers (Arzu and Dr. Frost) to discuss resolutions, such as why a protein may have disappeared in a gel
- Providing alternatives and possibilities to why an experiment failed, such as the bacteria not working rather than the technique not working
- Observing what worked previously to be more efficient in the future

Next Steps/Implications

- Continue determining which SH2 domain-containing proteins will bind to full-length Net1A
- Create cells without these SH2 domain proteins to see if Net1A will still leave the nucleus
Preventing HPV in the Coastal Bend Area: A Multi-Level Strategy to Reach Boys & Girls

Rachel Lalumiere 1 ♦ Melissa Valerio, PhD, MPH 2
1 State University of New York at Albany ♦ 2 The University of Texas School of Public Health, San Antonio

Introduction

Background: Only 33.9% of females and 17.7% of males have completed the three part HPV vaccination series in Texas. Youth residing in the Coastal Bend area have lower rates of uptake and completion of the HPV vaccine.

Aims: To improve vaccination rates among Hispanic adolescents using multi-level strategies. The program uses evidence based approaches to reach parents, schools, health care professionals, and adolescents through vaccination access, reminders and provider and key stakeholder education. My personal aim was to get the project started with a good foundation.

Methods

Intervention Mapping
1. Needs Assessment including a review of Literature: Created background knowledge of previous research and findings to build upon. Secondary data used to identify needs in community.
2. Creating Surveys & Interview Scripts: Used needs assessment and literature to design and adapt strategies to better reach the intended group.
3. Leading Interviews & Surveys: Developed pilot testing protocol to explore additional needs and determine if strategies are appropriate.
4. Creating the Intervention: Modified protocols and strategies and used them to create programs.

Findings & Next Steps

Part 1: Literature Reviews

Found that there are multiple barriers parents and adolescents face with regards to getting the HPV vaccine. Some are straight-forward, lack of education, but others are unique, health provider body language or words used when telling parents about the HPV vaccine. There is evidence that improving education and holding vaccinations at school improve vaccination rates.

Part 2: Creating Surveys & Interview Scripts

Many drafts have been written based on the literature reviews for use with different groups to deliver HPV vaccination education and increase uptake (Community Health Workers, physicians, teachers, etc.). We asked questions to identify what CHWs encounter when delivering information about HPV and its vaccine. These questions are framed to gain further insight into topics or to confirm pre-existing conclusions from literature review and needs assessment.

Part 3: Leading Interviews & Surveys

Three focus groups with parents, ten key informant interviews and one focus group with CHWs are planned. The group conducted was held with 6 community health workers. The interview was recorded and a preliminary summary was developed. The information we gain will be directly applied to the intervention and will inform the design of questions for additional groups.

Part 4: Create the Intervention

As interviews are being conducted, the plans for the actual intervention are revised. In the beginning of the project, many different ideas were discussed with a general trajectory being agreed upon. As we get more information from the Coastal Bend Area, we are able to tailor the intervention plans to better suit the needs of the community. Much of this will be completed in the future based on the protocol developed.

Implications

• Much work is still ahead, since the project is new
• Findings so far indicate a need and desire for an education program involving that also aids vaccination coordination and access.
• Even one person getting the vaccine who otherwise wouldn’t is one more person vaccinated against HPV cancers.

Innovation

• Phrasing a Question: When doing research, I had to form a question as to what the research was going to be answering.
• Group Work: work is split up between group members and is discussed as a group after completion. All work done is reviewed by other group members and often at least created together.
• Dissection: When forming plans for the intervention, we had to pull apart what we knew to see what we didn’t know or wanted to learn about.
• Frames: There were many assumptions surrounding why people do not get vaccinated but many times our best ideas were when we looked outside the box.

Acknowledgements: UTHealth Innovation for Cancer Prevention Research Training Program Summer Undergraduate Fellowship (Cancer Prevention and Research Institute of Texas grant RP# is 160015). The work completed will inform the resubmission of a CPRIT prevention application and work proposed for a CPRIT research application under review. I would like to acknowledge Dr. Valerio and Dr. Vernon for their work on this project. The findings and conclusions in this poster are those of the author(s) and do not necessarily represent the official position of National Cancer Institute.
The Role of UBE4B in Neuroblastoma Chemotherapy Sensitivity
Simone Menezes¹, David Savage²,³, Andrew Bean, PhD²,³
¹University of Texas at Austin, ²University of Texas Medical School, ³Graduate School of Biomedical Sciences, Houston, TX

Introduction

Background:
• Neuroblastoma is the 3rd most common cause of cancer-related pediatric death
• Survival rate for children older than 1 year is of 34-68%
• Most common extracranial childhood tumor
• Chemotherapy-resistant tumors and relapses are common
• Abnormal growth factor receptor expression is common in these tumors
• Growth factor receptors are important for growth of treatment-resistant cells
• UBE4B (ubiquitin ligase) can affect numerous growth factor receptors on cell surface
• More growth factor receptors may increase the sensitivity of cells to chemotherapy

Aim: Use CRISPR to remove UBE4B from neuroblastoma cell lines to study the effect on the chemotherapy sensitivity of neuroblastoma cells. Verify that UBE4B was removed from the cells.

Methods

CRISPR-Cas9
• Edit the UBE4B gene in neuroblastoma cell lines using CRISPR-Cas9
• UBE4B protein should no longer be produced

Purify DNA
• Purify genomic DNA from edited neuroblastoma cells

PCR
• Polymerase Chain Reaction
• Make many copies of area of gene where editing should have occurred

T7E1 Assay
• T7 Endonuclease I treatment
• Check for mutated DNA
• Cuts mismatched (mutated) DNA, producing 2 DNA fragments

Findings

Cells alive after transfection and antibiotic selection should have taken up the CRISPR-Cas9 system and should contain editing

Sections of gene that should be edited were successfully amplified using PCR

Amplified and annealed DNA was not cleaved after T7 Endonuclease I treatment – no editing in the tested cells

Innovation

• Traditional methods for depletion: siRNA, shRNA
  ▪ RNA interferes with protein production
  ▪ Still have low levels of protein produced
• CRISPR-Cas9 allows editing of the genome
  ▪ Alters UBE4B gene so protein cannot be produced
  ▪ Complete absence of UBE4B protein is possible
• Troubleshooting the DNA screening process required dissecting the problem, observation, and finding the right question

Implications/Next Steps

• Check cells for editing after shorter selection time
• Treat UBE4B-deficient cells with chemotherapy drugs and quantify cell death
• If cells without UBE4B are more sensitive to chemotherapy, UBE4B levels in patients can guide treatment choices

Acknowledgements: UTHealth Innovation for Cancer Prevention Research Training Program Summer Undergraduate Fellowship (Cancer Prevention and Research Institute of Texas grant # RP160015). This work was also funded by NIH R01 CA 166749 03. The findings and conclusions in this poster are those of the author(s) and do not necessarily represent the official position of the funding agency. I would also like to thank Natalie, Monica, Sahily, Kimmia, Ting, and Ritika from the Bean Lab.
**Introduction**

- **Background:** Identify the environmental health risks for disadvantaged communities in Houston, specifically the dangers of hazardous metal particulate matter (PM) in the air.
- **Aim:** Characterize the air pollution levels within disadvantaged communities. Develop a health action plan to manage any uncovered issues.

**Methods**

- **Study partners:** The City of Houston Department of Health and Human Services (HDHHS), Rice University, Air Alliance Houston, Metal recyclers, and Residents in disadvantaged neighborhoods.
- **Community Identification:** EISCREEN maintained by the US Environmental Protection Agency (EPA) to characterize the communities under observation.
- **Research:** Deploy air sampling devices at 4 different locations around the metal recycling facility (Upwind, fence line, and two downwind locations).
  - Work with Excel to analyze air sampling data.
  - Action: Hold frequent focus groups to discuss health action plan.

**Findings**

- **PM less than 2.5 microns in diameter, including hazardous metals, are capable of entering the circulatory system through the lungs and depositing on organs, such as the brain, heart, and liver.**

**Characterization of Air Pollution Levels by Location**

![Graph showing PM concentration by location](image)

- **Characterization of the PM size and mass concentration based on the location of the air sampler in relation to the metal recycling facility (Group 1: 0.25-3 µm, Group 2: 3.5-7.5 µm, Group 3: 8.5-17.5 µm, Group 4: 20-30 µm).**

**Innovation Tools**

- Use inductive reasoning to understand the emission patterns from the facility and surrounding sources.
- Constantly consider other PM emission sources of pollution other than the metal recycling facility.
- Use other concepts and applying to this research (consider traffic contributions to PM emissions, improved log sheets used during air monitoring, etc.).

**Next Steps/Implications**

- Work on publishing a research paper.
- Collect more air sampling data for further analysis.
- After completion of air sampling and analysis, conduct a risk assessment in May 2017.
- Continue holding focus groups to obtain information pertinent to developing a successful health action plan.
- Develop a health action plan.

Acknowledgements: UTHealth Innovation for Cancer Prevention Research Training Program Summer Undergraduate Fellowship (Cancer Prevention and Research Institute of Texas grant # RP160015). Special thanks to Dr. Inkyu Han for his dedicated mentoring and training throughout this project. The findings and conclusions in this poster are those of the author(s) and do not necessarily represent the official position of agencies.
Accessibility of Foods in Homes of Toddlers At-risk for Obesity

Marie Trudelle ¹  Shreela Sharma, PhD, LD, RD ²  Courtney Byrd-Williams, PhD ²
¹The University of Texas at Austin, ²The University of Texas School of Public Health, Austin, TX

Introduction

- **Background:** ENRICH is a home-based intervention program for obesity prevention among at-risk 2-3 year olds.
- **Previous home food inventory research looks at all food items available in the home and often takes requires an extensive amount of time, i.e., 45-60 mins.
- **Previous research only looks at availability of foods not accessibility.
- **Aim:** Develop a home food inventory to assess the foods that are accessible to children in the home using video to reduce assessment time. Observe the amount of fruits and vegetables and solid fats/added sugars that children can see and are readily accessible to them in the home versus empty calories available.

Methods

- **Video capture of fridge, countertops, and top of fridge used to record food items in the home**
- **19 families with overweight children ages 2-3 that are low income and ethnically diverse.
- **Adapted the Fulkerson home food inventory checklist to code videos.

Findings

**Items considered Empty Calories**

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<thead>
<tr>
<th>Solid Fats and Added Sugars (SoFAS)</th>
<th>Cookies</th>
<th>Cake/Cupcakes</th>
<th>Muffins</th>
<th>Other snack cake</th>
<th>Pastry, sweet rolls, donuts</th>
<th>Potato chips</th>
<th>Tortilla Chips</th>
<th>Cheese curls or *</th>
<th>puffs</th>
<th>Sodas</th>
<th>Sports Drinks</th>
<th>Chocolate Candy</th>
<th>Hard Candy</th>
<th>Gummies</th>
<th>Fruit rolls, fruit snacks</th>
<th>Chewy Candy</th>
</tr>
</thead>
</table>

**Fruits and Vegetables assessed**

| Asparagus | Beets | Bell Peppers | Broccoli | Cabbage | Cauliflower | Carrots | Celery | Corn | Cucumbers | Green beans | Lettuce | Mushrooms | Peas | Potatoes | Spinach/other greens | Squash | Sweet Potatoes | Tomatoes | Mixed Vegetables | Apples | Avocado | Berries | Citrus | Dates | Grapes | Kiwi | Mango | Melons | Mixed fruit | Pears | Pineapples | Prunes | Raisins | Stone fruits |
|-----------|-------|--------------|----------|---------|-------------|---------|------|-----|-----------|-------------|---------|------------|------|----------|----------------|------|-----------------|--------|-------------------|-------|--------|---------|--------|-------|--------|--------|--------|--------|--------|--------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|

**Fruits and Veggies**

<table>
<thead>
<tr>
<th>Average</th>
<th>Max</th>
<th>Min</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.58</td>
<td>9</td>
<td>1</td>
<td>8</td>
</tr>
</tbody>
</table>

**SoFAS**

<table>
<thead>
<tr>
<th>Average</th>
<th>Max</th>
<th>Min</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.26</td>
<td>8</td>
<td>0</td>
<td>8</td>
</tr>
</tbody>
</table>

- **On average, families had 4.58 fruits or vegetables that children could see or grab from the fridge, counter, or top of fridge out of 46 fruits and vegetables assessed, while they had, on average, 2.26 SoFAS out of 16 items assessed.
- **It is important to remember that families likely had more fruits and vegetables and SoFAS in the pantry, drawers of the fridge, and freezer. These numbers only reflect what is likely accessible or visible to children.
- **The highest number of fruits and vegetables a family had was 9 out of 46 possible fruits and vegetables, while the highest number of SoFAS was 8 out of 16 possible items.**

Next Steps/Implications

- **These findings identify a target for future obesity prevention intervention programs, i.e., a need for improvements in the foods children may see in the house.**
- **The next step would be to investigate how the foods children see on countertops, in the fridge, and on top of the fridge affect children asking behaviors.**
- **Next steps will also examine ENRICH intervention effects on foods in the home.**

Innovation Tools

- **Came up with measurement tool and assessed variety of fruits and vegetables and SoFAS in the home.**
- **Juggling induction and deduction**-used video observation to come up with measurement tool and used a partial measurement tool to fit the food items captured on video.
- **Observation**-researched previous home food inventory methods and observed what foods children can see or have access to in the home.
- **Recombination and rearrangement**-used the Fulkerson home food inventory checklist and restructured it to fit the food items we were able to capture using the video assessment.
- **Broadening perspective**-started project with intent to assess availability of foods in the home, but had to take a step back and look for other options when that was not possible.

Acknowledgements: UTHealth Innovation for Cancer Prevention Research Training Program Summer Undergraduate Fellowship (Cancer Prevention and Research Institute of Texas grant # RP160015). The findings and conclusions in this poster are those of the author(s) and do not necessarily represent the official position of the funding agency. We would like to thank the National Institutes of Health all of the families who participated in this study.
Catering to the Population: Increasing Retention Rates of Young Gay Men Through Social Media

Author: Virani, Mehek  PI: Fujimoto, K., Ph.D
The University of Texas School of Public Health, Houston, TX

Background: The Young Men's Affiliation Project analyzes social networks to better understand the affiliation between young men who have sex with men (YMSM) and the social spaces they frequent. To do this, we interview participants twice.

Aims: The project aim is to design intervention targeted for YMSM by collecting longitudinal data. Participant retention is essential. My aim was to use social media to aid in the effort to increase the project retention rate.

Introduction

<table>
<thead>
<tr>
<th># of participants</th>
<th>Percentage engaged</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 20th, 2016</td>
<td>0</td>
</tr>
<tr>
<td>August 8th, 2016</td>
<td>33</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th># of participants</th>
<th>Percentage engaged</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 20th, 2016</td>
<td>70</td>
</tr>
<tr>
<td>August 8th, 2016</td>
<td>87</td>
</tr>
</tbody>
</table>

Features & Progress of Social Media Pages (Findings)

- Instagram page focuses on humor as an effort to be more relatable to participants
- Approximately 8-10 posts every week
- Personal comments on participants' posts

- Facebook page focuses on public health news and current events
- Approximately 5-7 posts every week
- Participant interaction through "likes" to protect confidentiality

Methods

- My aim: to use social media to further increase the retention rate.
- Increase retention rate using social media
- Interact with participants on the social media platforms Facebook and Instagram
- Post regularly on these platforms to encourage participants to follow us
- Post information relevant to our participant population

Next Steps

- Continue consistent social media activity
- Continue adding new connections until all participants are added on social media
- Continue observing content posted by participants in order to cater to their interests
- See our retention rate increase continually to reach our goal of 80%

Acknowledgements: UTHealth Innovation for Cancer Prevention Research Training Program Summer Undergraduate Fellowship (Cancer Prevention and Research Institute of Texas grant # RP160015). Parent project funding: NIH/NIMH 1R01MH100021. The findings and conclusions in this poster are those of the author(s) and do not necessarily represent the official position of the funding agencies.

Literature shows that consistent interaction with participants on social media yields higher retention rates. I also found that Instagram is the most efficient way to connect with our participants, due to the dynamics of gay male culture. Through observation, I found that the focus on photo-sharing on Instagram aligns with the focus of taking care of and showing off one's body and form that is emphasized among gay males. For this reason, I built up and maintained the Instagram profile, in addition to the pre-existing Facebook profile.

Citations:

Innovation Tools

- Frame-Shifting: I asked myself, "Are academic posts the only type of content I should release on social media? Would another approach work better?"
- Observation: Research studies typically post content that is academic in nature on social media profiles. However, through observation, I found that posts that are humorous and light-hearted in nature are of more interest to YMSM. This is the kind of content I decided to post on Instagram.
- Using these tools, I created and maintained an Instagram page for the study that put out content that is unseen in an academic setting.
# Building a Knowledge Base of Health IT Incidents

**Frank Wang** ¹ * Hong Kang, PhD ² * Qi Miao ² * Zhou Sicheng ² * Chen Liang, PhDc ² * Yang Gong, MD-PhD ²

¹ University of Texas at Austin * ² University of Texas School of Biomedical Informatics at Houston

## Introduction

- Patient safety events cause over 250,000 deaths annually. These events need to be better understood to minimize the risks patients face.
- Adoption of health information technology has led to a new type of patient safety event that has yet to be explored.

## Objective

- My contribution has been to build a knowledge base of patient safety events resulting from health IT incidents.

## Methods

1. **Step 1:** Define health information technology
2. **Step 2:** Extract a subset of cases from the FDA MAUDE database for review
3. **Step 3:** Build a machine learning classifier
4. **Step 4:** Apply the classifier on the entire FDA database to grow the knowledge base

## Findings/Results

**Health IT Definition:** A health IT device is any device that utilizes both hardware and software to facilitate health information exchange in order to aid in the diagnosis, treatment, or prevention of disease.

**Common Causes:** User error, software bugs, and hardware malfunctions

**Health IT Related Incidents:**

- Prescription Overdose
- Monitor Malfunction
- Patient Mix-up

**Machine Learning Classifier:** Logistic Regression

- **Accuracy:** 88.6%
- **F-Measure:** 0.885
- **ROC Area:** 0.914

## Implications/Future Work

- Better understanding of the hazards of health IT
- Topic modeling to uncover deeper relationships among health IT incidents
- Clinical decision support system to provide timely support to those involved in health IT incidents

## Innovation (PIG In MuD)

- My innovative contribution has been the development of a model to identify health IT events. The model holds promise in aiding the understanding and prevention of future health IT incidents.

**P:** Can health IT be made safer to improve patient safety? (Bold ✅, Actionable ✅, Plausible ✅)

**I:** New Frame: Technology makes healthcare dangerous.

**G:** Health care should like the airline industry use a shared learning system to improve safety. (Analogy)

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**Acknowledgements:** UTHealth Innovation for Cancer Prevention Research Training Program Summer Undergraduate Fellowship (Cancer Prevention and Research Institute of Texas grant # RP160015). This project was funded by an AHRQ CPRIT training grant, UT System patient safety grant, and a CPRIT postdoctoral fellowship grant. The findings and conclusions in this poster are those of the author(s) and do not necessarily represent the official position of the funding agencies.