Chanapong Rojanaworarit – *Public Health*

Peer-reviewed Research Publications:

1. **Rojanaworarit, C.**, & Wong, J. (2019). Investigating the Source of a Disease Outbreak Based on Risk Estimation: A Simulation Study Comparing Risk Estimates Obtained From Logistic and Poisson Regression Applied to a Dichotomous Outcome. *Ochsner Journal, 19(3)*, 220-226.

ABSTRACT: Objective: To empirically compare risk estimates obtained from logistic regression and Poisson regression with robust standard errors in terms of effect size and determination of the most likely source in the analysis of a series of simulated single-source disease outbreak scenarios. **Methods:** A prototype dataset was created to simulate a foodborne outbreak following a public event with 14 food exposures and 52% overall attack rate. Regression methods, including binary logistic regression and Poisson regression with robust standard errors, were applied to analyze the dataset. To further examine how these two models led to different conclusions of the potential outbreak source, a series of 5 additional scenarios with decreasing attack rates were simulated and analyzed using both regression models. **Results:** For each of the explanatory variables—sex, age, and food types—in both univariable and multivariable models, the odds ratio obtained from logistic regression was found to be estimated further away from 1.0 than its corresponding risk ratio estimated by Poisson regression with robust standard errors. In the simulated scenarios, the Poisson regression models demonstrated greater consistency in the identification of the intended food source as the most likely outbreak source. **Conclusion:** Poisson regression with robust standard errors was a decisive and consistent method to estimate risk associated with a single source in an outbreak when the cohort data collection design is employed.

Conference Poster Presentations:

1. Vasile, E.M., Santella, A.J., **Rojanaworarit, C.**, Vartanian, B., Miller, D.J. (2019). Oral Health Screening and Education for Special Needs Children and Young Adults. In APHA 2019 Annual Meeting and Expo. Philadelphia: American Public Health Association.

ABSTRACT: Introduction: Children, adolescents, and young adults with special needs, including those with physical, developmental, or behavioral conditions, often require extensive dental services. This population is prone to gum disease and dental caries because of inadequate oral hygiene, lack of dental insurance, and few properly trained dental providers. **Methods:** Volunteer dentists, dental residents, and dental hygienists provided oral examinations, application of fluoride varnish, and dental education as part of Project Accessible Oral Health's "Take a Dental Health Day". Paper exam forms were entered into Excel. Descriptive statistics and differences in proportions of oral health outcomes by participants' characteristics was evaluated using chi-squared tests in SPSS. **Results:** Of the 200 total participants, 78 (39%) persons received screenings while all participants received dental education using puppets and audiovisual. The mean age was 13 years (range=5-25 years) and 55/78 (70.5%) reported having recently visited a dentist. Fluoride varnish was applied to 58/78 (74.4%). Poor oral hygiene was found in 14 participants (17.9%). Possible caries were recorded in 24 individuals (30.8%) while large caries requiring urgent treatment were found in 5 (6.4%). There was no significant difference in oral hygiene status and presence of dental caries among different gender (p=0.89), race (p=0.54), ethnicity (p=0.31), and having previous dental visits (p=0.31). **Conclusion:** Dental caries remain a major problem among children and young adults with disabilities. Targeted dental public health screening programs are needed to facilitate access to oral health. Further exploration is needed to find strategies to increase the dental workforce for people with disabilities.

Professional Presentations:

1. **Rojanaworarit, C.,** Claudio, L., Howteerakul, N., Siramahamongkol, A., Ngernthong, P. (2019). Dental fluorosis in children and effect of hydrogeochemical occurrence of fluoride in groundwater used for household water supply in an agriculture-based communities in Thailand: a community-based survey and case-control study. In APHA 2019 Annual Meeting and Expo. Philadelphia: American Public Health Association.

ABSTRACT: Introduction: Groundwater is used for water supply in communities without established irrigation system in Bang Len District, Nakhon Pathom, Thailand. High fluoride has also been identified for water samples obtained from local sources. Nonetheless, prevalence and severity of dental fluorosis and its association with fluoride in community water supply has not been investigated to facilitate dental fluorosis surveillance system establishment and policy making for safe water supply. **Methods:** A

survey in 289 children, aged 6 to 10, attending 8 primary schools in 5 subdistricts of Bang Len was conducted in 2015. Dental fluorosis and its severity were determined by a calibrated dentist using Dean's index. Children with very mild to severe fluorosis were regarded as 'cases' while the rest were 'non-cases' for the second phase of case-control study. Fluoride concentrations in community water supply corresponding to resident of child were traced and averaged from 2008 to 2015. Measurement of other exposures was undertaken using questionnaire. Multivariable logistic regression was employed to determine effect of fluoride in water on fluorosis, adjusting for other covariates. **Results:** There were 157 children with very mild to moderate dental fluorosis (54.3% prevalence). Multivariable logistic regression revealed meaningful effect of exposure to fluoride in water [0-0.69 ppm as reference | 0.7-1.49 ppm (index group 1): OR=4.8, 95%CI=0.5-46.4 | ≥1.50 ppm (index group 2): OR=19.7, 95%CI=2.2-179.7]. **Conclusion:** High fluoride concentration in water supply obtained from groundwater was strongly associated with dental fluorosis. Alternative water sources with low fluoride or defluoridation should be considered in this setting without established irrigation system.

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Professional Presentations

Rojanaworarit, C. & Wong, J. (2018) Risk estimation in outbreak investigation: A simulation study comparing risk estimates obtained from generalized linear models applied to high-incidence dichotomous outcome. In The 3rd International Conference of Multidisciplinary Approaches on UN Sustainable Development Goals UNSDGs 2018, Bangkok, Thailand

ABSTRACT: Objective: To carry out empirical comparisons of risk estimates obtained from three generalized linear models applied in the analysis of high-incidence dichotomous outcome. **Methods:** A dataset was created to simulate a foodborne outbreak following a public dinner with 14 food type exposures with 52% overall attack rate. Three generalized linear models—binary logistic regression, log-binomial regression, and Poisson regression with robust standard errors—were applied to analyze the same dataset. Risk estimates and confidence intervals obtained from these models were compared for each explanatory variable. **Results:** For each of the explanatory variables in both the univariable and multivariable models, the odds ratio obtained from logistic regression was found to be estimated further away from 1.0 than its corresponding risk ratio estimated by Poisson regression with robust standard errors. The multivariable log-binomial regression model did not converge to yield any risk estimates. **Conclusions:** Poisson regression with robust standard errors that directly estimated RR should be used rather than logistic regression as the method of choice when analyzing a cohort study with a relatively common outcome.