The Canary System (CS) is a technology for caries detection based on photo thermal radiometry (PTR), a modulated thermal infrared response of a medium, and modulated luminescence (LUM). CS collects data including Canary Numbers (CN) (which are indicative of the presence or absence of caries).

The Canary Cloud is a HIPAA and PIPEDA compliant, secured, cloud based environment that stores de-identified scan data collected by the CS.

Data generated by CS may have the potential to offer investigators the ability to assess caries trends across populations and develop an alternate surveillance system.

This study aimed to 1) compare variations in CS data between geographic regions in the US, and 2) explore correlations between CS data as a proxy for caries and state level public health data related to income, health insurance and water fluoridation status.

Data related to caries and demographics was extracted from the Canary Cloud between June 1, 2011 and Sept 1, 2015. De-identified data was accessed from 49 clinics in the US, who connected to the Canary Cloud representing over 75,896 scan observations from clinically meaningful scan sessions.

State public health data was extracted from various sources including a) the Centers for Disease Control and Prevention (CDC), and b) the US Census 2013 data files and included information related to the proportions of people served by community water systems receiving fluoridated water, with no health insurance, with income less than the federal poverty level, and who visited the dentist or a dental clinic in the past 12 months.

Descriptive information was generated for all the different variables by five US regions (Region 1: CA, NV, Region 2: TX, Region 3: MN, WI, IL, MI, Region 4: NY, NJ, PA, MA and Region5: NC, SC, FL).

Differences in caries proportions as defined by the Canary Zones (CN 0-20: healthy, CN 21-70: early non-cavitated lesions; CN 71-100: cavitated lesions) among the five regions were explored using a Chi-Square Test. Linear correlations between CD and public health information were generated using Spearman Correlation Coefficients. Statistical significance was set at p< .05.

Data were organized in an excel spreadsheet and analyzed using SAS 9.2.

Canary System

• There are significant variations in dental caries at varying disease stages (early lesions and severe cavitated lesions) as indicated by the CN between US regions.

• A higher number of regions should be compared to accurately explore the association between this caries proxy and public health data.

• Cloud computing capability of the CS may be valuable for public health planning and epidemiological surveillance.