



Root cause analysis underscores the importance of understanding, addressing and communicating cold chain equipment failures to improve equipment performance

Shahrzad Yavari Nexleaf Analytics





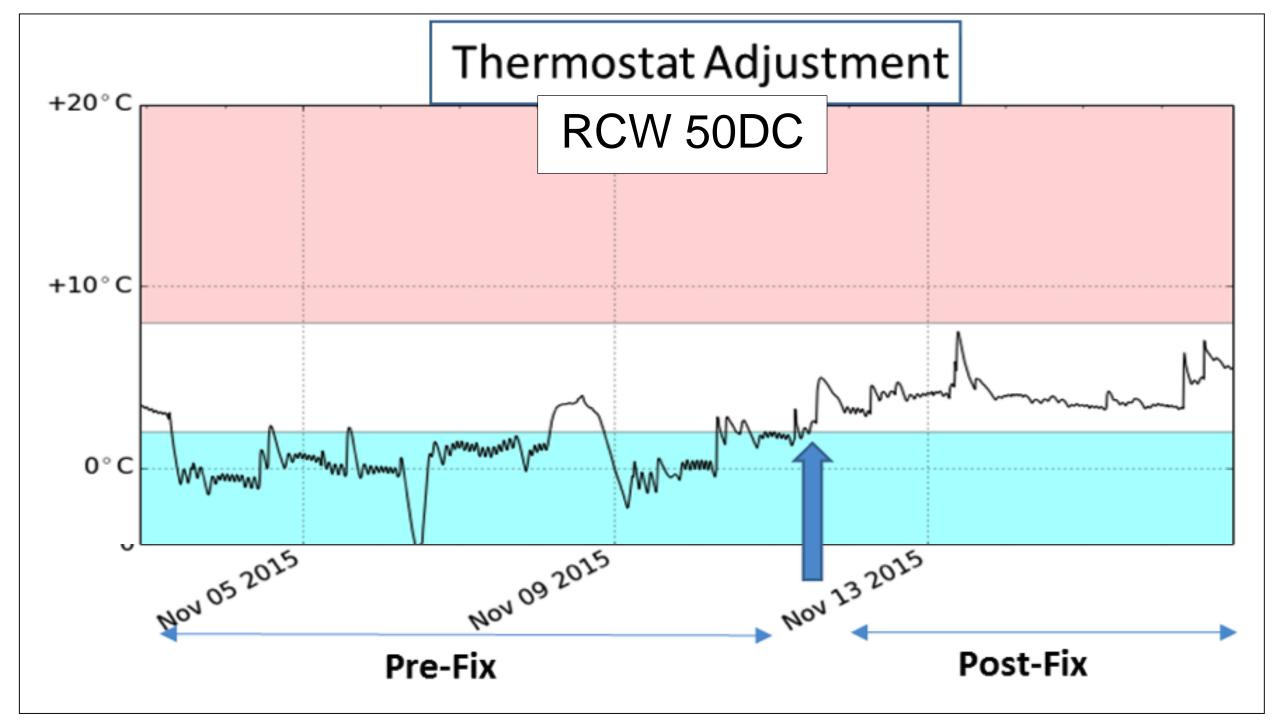






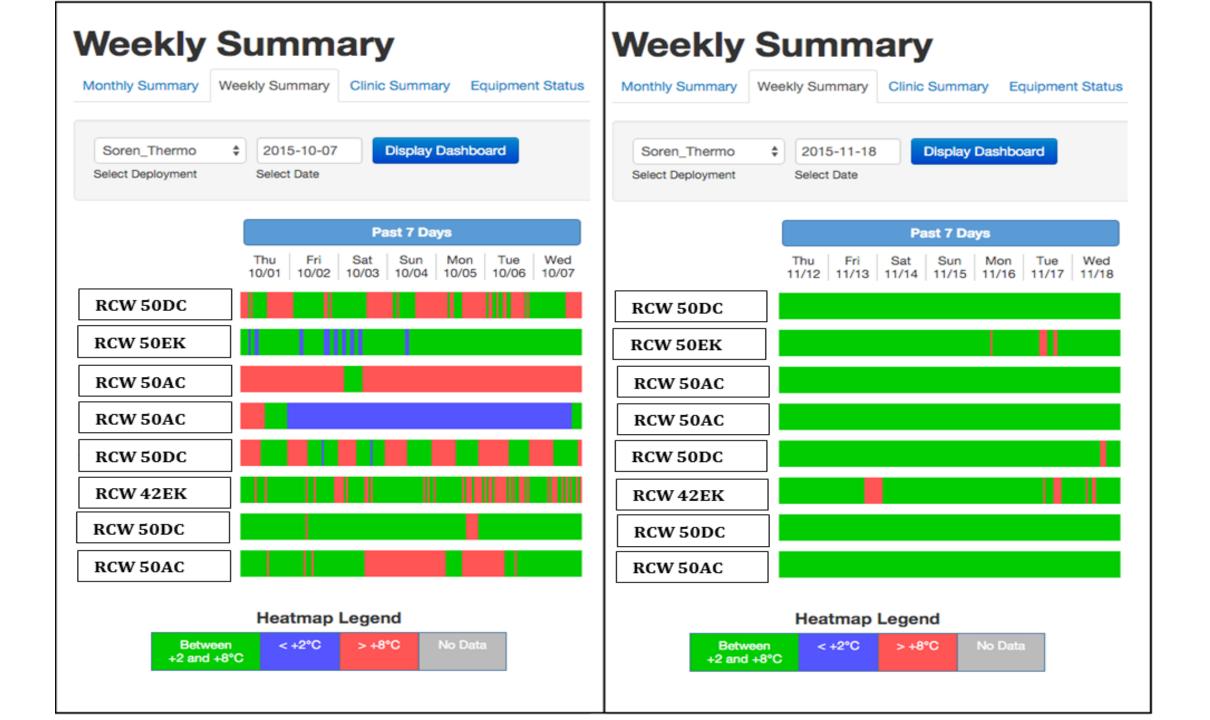


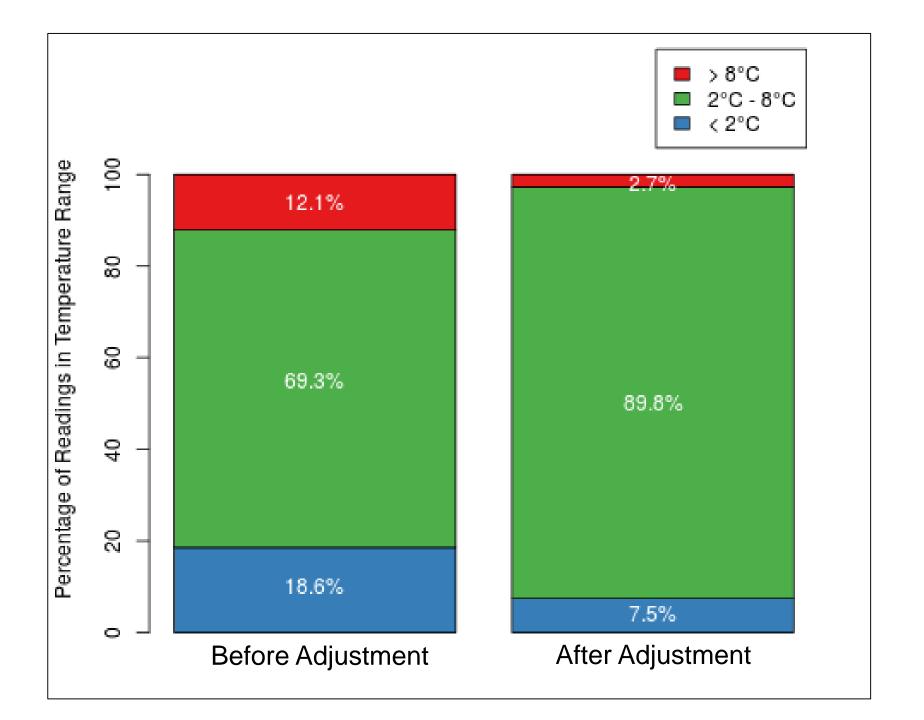


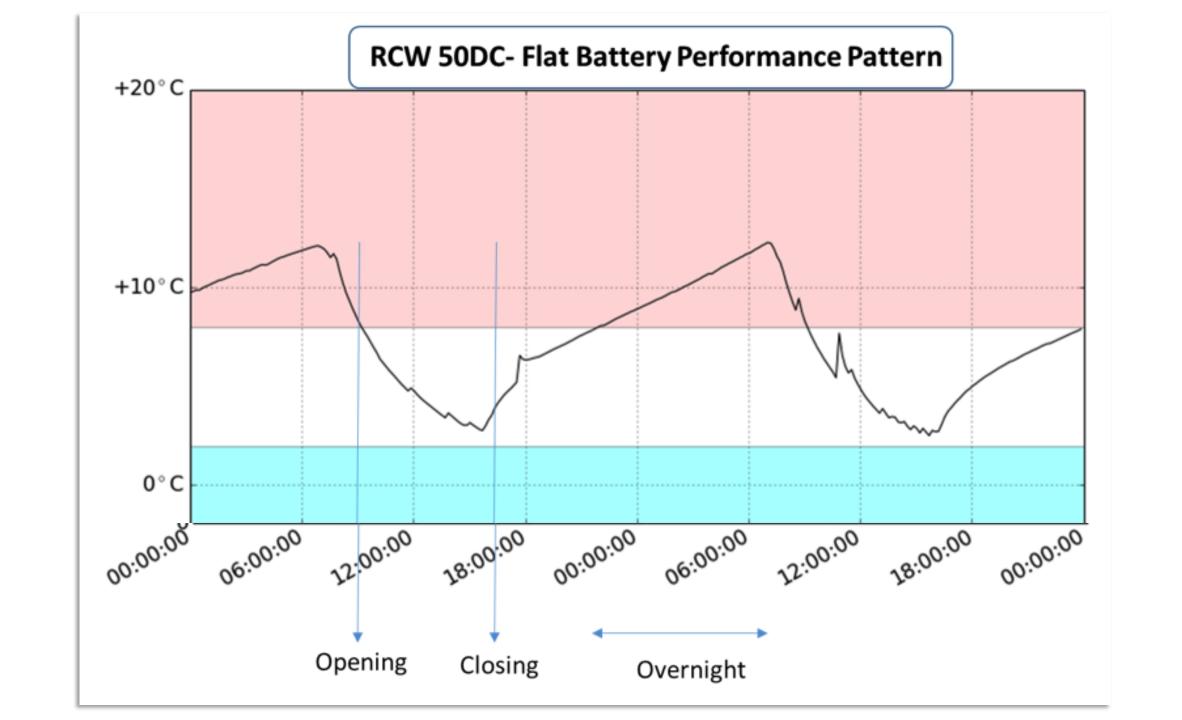


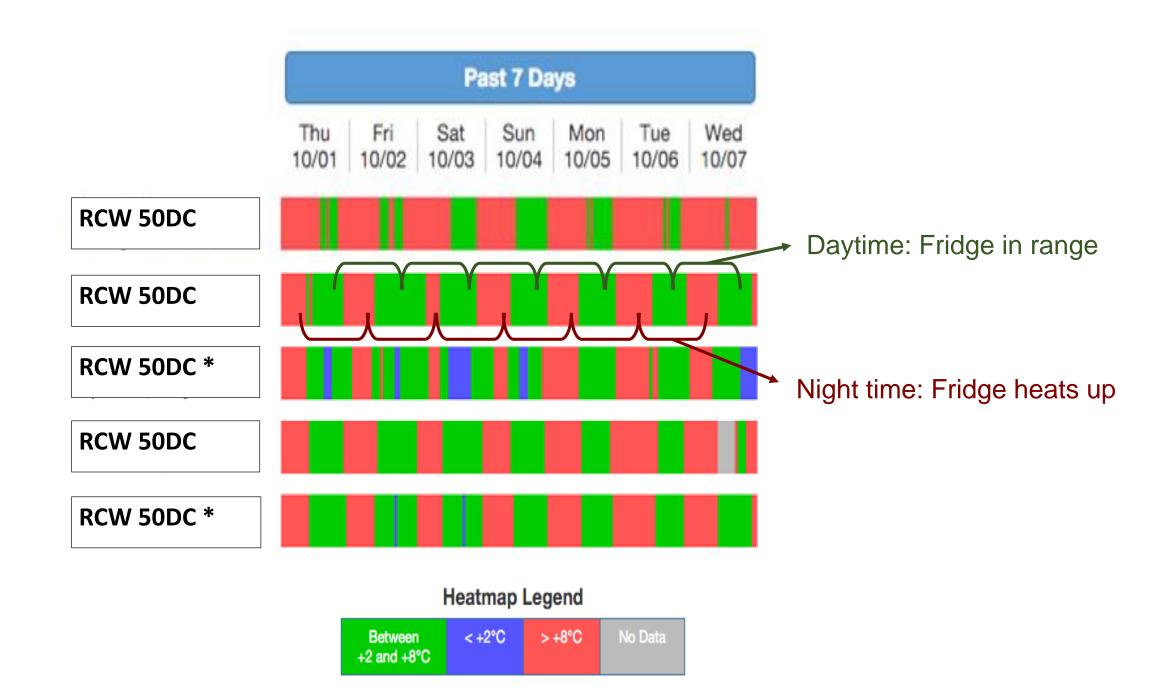


































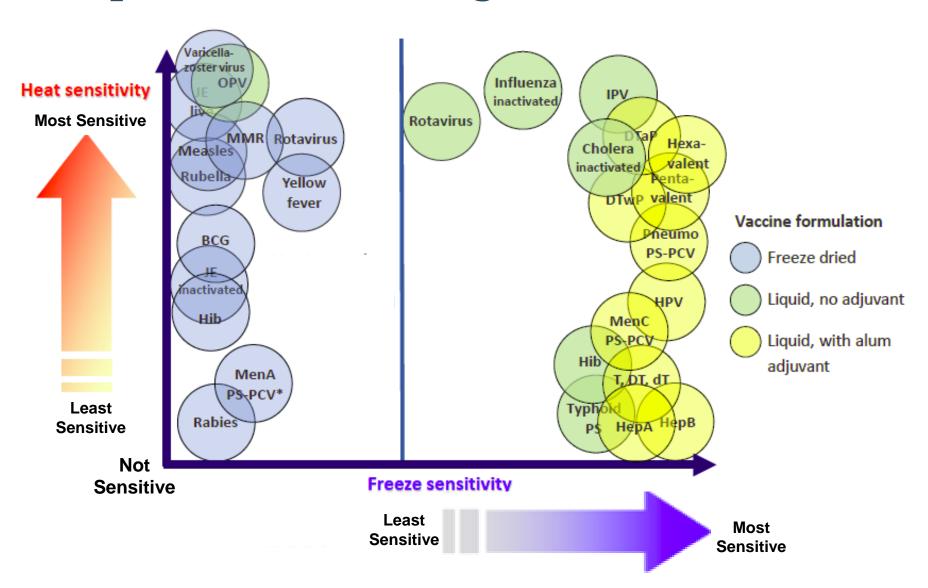
Is freezing an on going issue in the vaccine cold chain? A systematic literature review

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Temperature Sensitivity of Vaccines



^{*}The diluent for MenA PS-PCV contains alum adjuvant and is freeze sensitive

Source: WHO & PATH.. Slide Set.. 2014. Available at:

The in-country vaccine journey









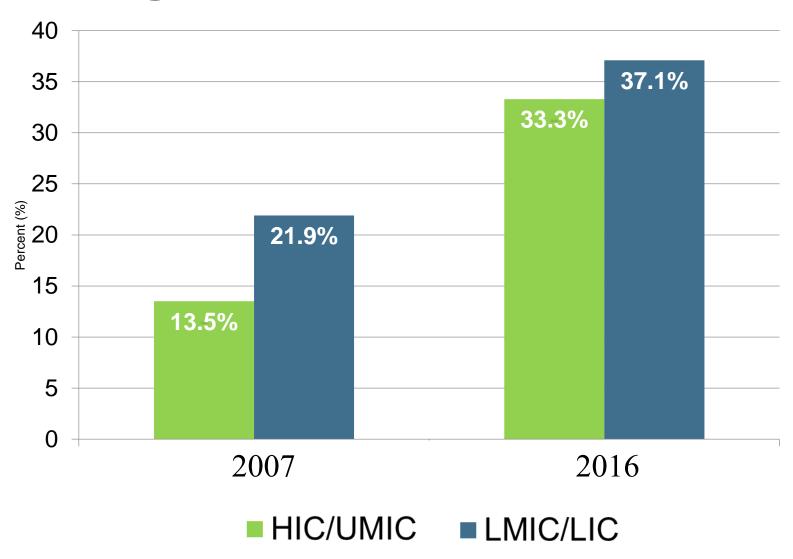




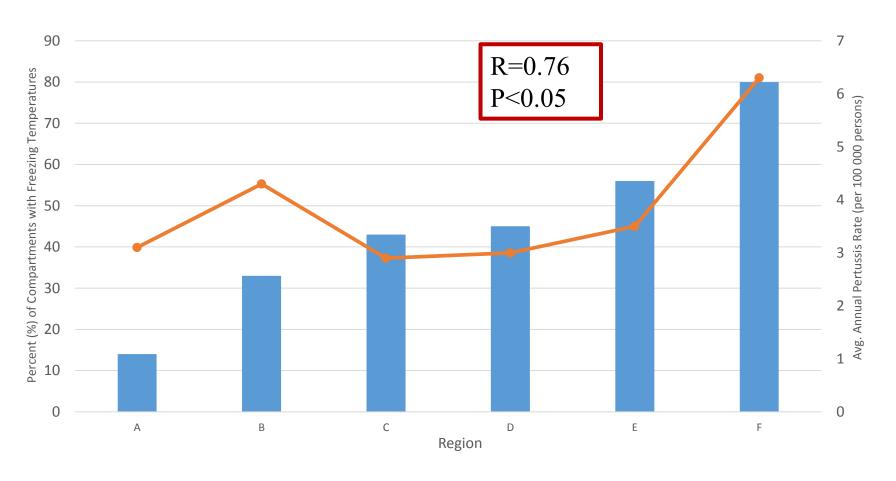
Updated Literature Review

- Updated Review from Matthias, et al., 2007
- From 1985 to June 2006, 35 articles assessed vaccine exposure to freezing, averaging 1.7 articles per year
- This update identified 29 articles in the last 10 years, averaging
 2.9 articles per year
- Analysis examined studies that assessed temperature at specific time points and those that continuously monitored temperature (rigorous studies)
 - More rigorous studies in transport in HIC/UMICs
- Sample sizes Varied Widely:
 - 3 to 440 storage units
 - 1 to 103 shipments
 - 3 to 103 for outreach sessions

Freezing Exposure During Storage Increased



Exposure to Freezing Temperatures and Possible Links to Outbreaks: Pertussis



■ % Compartments with Freezing Temeperatures → Avg Annual Pertussis Rate per 100,000 persons



Yes! Freezing is Still an Issue





Key Lessons:

- More countries implementing continuous temperature monitoring
- More countries are conducting temperature monitoring studies
- New technology: visual sticker on vial to detect freezing
- Training and Supervision of vaccinators and cold chain staff



