(99th percentile) were addressed and predicted healthcare costs were obtained through bootstrapping (500 replications).

Results: During the 2018–19 influenza season, the PSM sample comprised 561,243 recipients of aTIV and 561,243 recipients of TIV-HD. Following GEE adjustment, predicted mean annualized all-cause and influenza-related costs per patient were statistically similar between aTIV and TIV-HD (US$9,676 vs. US$9,625 and US$23.75 vs. US$21.79, respectively). Both aTIV and TIV-HD were comparable in terms of predicted mean annualized costs for influenza-related hospitalizations (US$20.28 vs. US$18.13) and influenza-related office visits (US$1.29 vs. US$1.34).

Conclusion: In adjusted analyses, total all-cause and influenza-related healthcare costs were comparable among elderly subjects vaccinated with either aTIV or TIV-HD.

Disclosures: **Maarten Postma, Dr.**, **IQVIA** (Consultant) **Stephen I. Pelton, MD**, **Merck vaccine** (Consultant, Grant/Research Support)**Pfizer** (Consultant, Grant/Research Support)**Sanofi Pasteur** (Consultant, Other Financial or Material Support, DSMB)**Seqirus Vaccine Ltd.** (Consultant) **Victoria Divino, PhD**, **Seiqrus Vaccines Ltd.** (Consultant) **Joaquin F. Mould-Quevedo, PhD**, **Seqirus Vaccines Ltd.** (Employee, Shareholder) **Drishti Shah, PhD**, **Seqirus Vaccines Ltd.** (Consultant) **Mitchell DeKoven, PhD**, **Seqirus Vaccines Ltd.** (Consultant) **Girishanthy Krishnarajah, PhD**, **Seqirus Vaccines Ltd.** (Employee, Shareholder)

30. Impact of Pharmacist Assertiveness Training in Recommending Pneumococcal Vaccination among High-Risk Adults

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Session: P-2. Adult Vaccines

Background: Community pharmacies have become vital access points to provide a range of vaccines to adults, including pneumococcal; however, despite growth in vaccines given at these sites, the most recent rates of adults being immunized against pneumococcal disease remain below goals set by Health People 2020. A lack of patient awareness is a leading reason for low vaccination rates, suggesting that a need exists to improve provider communication in recommending pneumococcal vaccination in high-risk adults.

Methods: A multi-phase, pharmacy-based intervention was launched in west and middle Tennessee locations of a nationwide community pharmacy chain focusing on improving evidence-based, presumptive recommendations related to pneumococcal vaccination. All locations were randomized to one of three arms based on training intensity: 1) no training; 2) online training only; and 3) online and live simulation training. The program focused on providing assertive recommendations and managing potential hesitancy guided by multiple health communication theories and community-based hesitancy data provided to each pharmacy by the study team. Primary endpoints included changes in pneumococcal vaccinations (counts over 6-month periods [July-December] in 2018 and 2019) and provider vaccine-related self-efficacy and were evaluated by generalized linear models.

Results: A total of 100 pharmacies were enrolled and 50 pharmacists completed their assigned training element. Completing the full training program (i.e., online and live) led to improvements in pharmacist self-efficacy related to being influential in vaccine-related decisions and not being helpless in managing resistance (both $p< 0.05$). Overall counts of all pneumococcal vaccines were lower (-11.3%) across all stores in the period following training; however, a small increase (2.1%, P=0.084) was observed in the stores that underwent the full training, versus decreases of 22.0% and 9.4% in control and online-only training comparisons, respectively.

Conclusion: Results suggest that provider vaccine self-efficacy can be improved through an evidence-based communication training program but substantial improvements in specific vaccinations may need to leverage a more holistic focus on all recommended adult vaccines.

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31. Influenza Vaccination During Pregnancy: A Descriptive Cross-sectional Survey of the Knowledge, Beliefs, and Attitudes of Mexican Gynecologists and Family Physicians.

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Session: P-2. Adult Vaccines

Background: Influenza in pregnancy is associated with elevated morbidity and mortality. Influenza vaccines are both safe and effective in pregnancy, supporting routine use in this population. Even though influenza vaccination in Mexico is recommended for pregnant women, there are no publications of influenza vaccine coverage in pregnancy.

This is the first Latin American survey done only in physicians aiming to assess the knowledge, beliefs, and attitudes that Mexican Obstetrics-Gynecologists (OBG) and Family Physicians (FP) have towards influenza and influenza immunization during pregnancy.

Methods: A cross-sectional survey was conducted, both paper-based and online. The questionnaire was composed of 35 questions, which addressed general knowledge of influenza, recommendations for vaccination during pregnancy, and beliefs and attitudes concerning the acceptability of the vaccine in pregnant women.

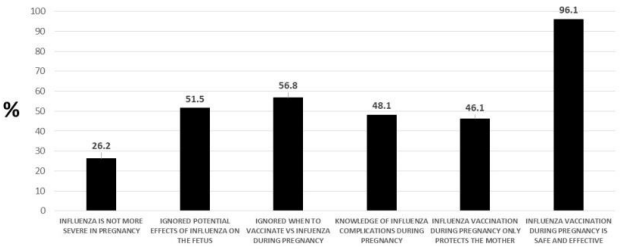
Results: A total of 206 completed surveys were available, 98 (47.6%) from OBG, 108 (52.4%) from FP. Regarding current practicing medical institutions, 76 (37%), 69 (34%), 31 (14.5%), 30 (14.5%) reported working for the Mexican Institute of Social Security, Private Sector, Secretariat of Health, or a combination of all respectively, *representing an estimated 2,472 daily pregnancy consultations.*

About a quarter (26.2%) reported not having a notion that influenza is more severe among pregnant women. More than half (51.5%) ignored the potential side effects of influenza infection on the fetus. The majority (56.8%) did not know when vaccination during pregnancy should occur.

Pregnancy as a risk factor for developing influenza complications was known only in 48.1%. Also, 46.1 % believed that vaccination only confers protection to the mother, but not to the fetus. Nevertheless, 96.1% considered that immunization against influenza during pregnancy is a safe and effective preventive intervention.

A results' summary is shown in Figure-1.

FIGURE – 1
SUMMARY OF SURVEY´S RESULTS (%) DONE IN 206 MEXICAN OBG's AND FP´s



Conclusion: Based on this survey, current knowledge of OBG and FP for influenza morbidity and mortality during pregnancy, and the importance of influenza vaccination in pregnant women, is poor.

Mandatory recommendations to educate medical providers regarding influenza vaccination during pregnancy in Mexico are necessary, even as imperative for CME credits.

Disclosures: **All Authors**: No reported disclosures

32. Influenza Vaccination Prevalence Among Adults with and without HIV by Race, Age, and Sex

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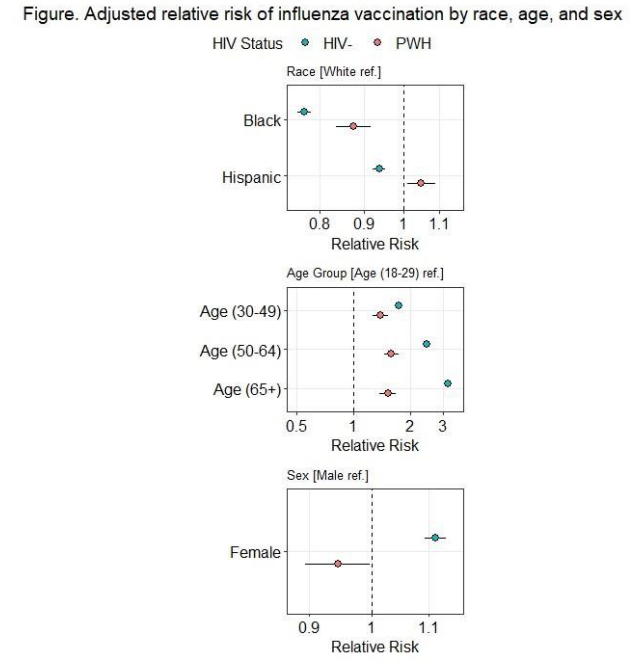
Session: P-2. Adult Vaccines

Background: People with HIV (PWH) may be more likely than people without HIV (HIV-) to receive influenza vaccinations. However, it is unknown if there are demographic differences in vaccination rates and whether this varies by HIV status.

Methods: We identified all adult PWH (≥18 years) and 20:1 race-, age- and sex-matched HIV- adults enrolled in Kaiser Permanente Northern California between 2013 - 2017. We evaluated prevalence of influenza vaccinations during the 2013 – 2016 flu seasons (September 1 to March 31). We used Poisson regression models with repeated measures (subjects contributed to multiple flu seasons) to estimate the relative risk [RR] of influenza vaccinations by race, age, and sex within HIV status strata. Multivariable models included terms for HIV status, race, age, sex, unhealthy alcohol use, smoking status, calendar year, alcohol use disorder, census-based education/income, depression, insurance type, and outpatient visits, and interaction terms for HIV*race, HIV*age group, and HIV*sex.

Results: The study sample included 7,422 PWH and 152,305 HIV-. 90% of PWH and 91% of HIV- were men; mean age at baseline was 49.4 (PWH) and 50.6 (HIV-) years; and 45% of PWH and 44% of HIV- were non-White. In adjusted models, PWH were more likely to receive the influenza vaccine compared with HIV- (RR 1.51; 95% CI 1.50–1.54). Among HIV-, Blacks were less likely to receive the vaccine compared with Whites (RR 0.77; 0.76–0.78); this effect was attenuated in PWH (RR 0.88; 0.84–0.92) (Figure, panel a). Among HIV-, older age groups were more likely to receive the vaccine compared with the 18 – 29 age group, with attenuated RRs among PWH (Figure, panel b). Among HIV-, females were more likely to receive the vaccine compared to males (RR 1.11; 1.09–1.13) while among PWH, females were less likely compared to males (RR 0.94; 0.89–1.00; p=0.04) (Figure, panel c).

Adjusted relative risk of influenza vaccination by race, age, and sex



Conclusion: PWH were more likely to be vaccinated against influenza than HIV-. In both PWH and HIV-, Blacks and younger age groups were less likely to be vaccinated, although these associations were attenuated in PWH. The effect of sex varied by HIV status with increased vaccination rates for female HIV- but reduced rates for female PWH. Targeted efforts are needed to continue to close the gap in demographic disparities regarding influenza vaccination rates among PWH.

Disclosures: Michael Silverberg, PhD, MPH, Gilead Sciences, Inc. (Grant/Research Support)

33. Intranasal M2SR (M2-deficient Single Replication) Live H3N2 Influenza Investigational Vaccine Induces Serum HAI & Broad Immune Responses in High Proportion of Adults

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Session: P-2. Adult Vaccines

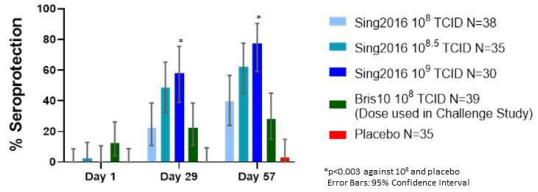
Background: A single intranasal (IN) dose of 10^8 $TCID_{50}$ M2SR protected a responder subset of adults against infection and disease in a prior human influenza challenge study (EudraCT number: 2017-004971-30). Higher dose levels of M2SR were assessed in this phase 1b study to enhance immune responses and further increase protection levels in adults.

Methods: A double-blind, randomized, placebo-controlled dose escalation study (NCT03999554) was conducted at 4 US study sites with two different H3N2 M2SR vaccines that contained HA & NA from either A/Brisbane/10/2007 or A/Singapore/INFIMH-16–0019/2016. Serosusceptible 18–49 year old subjects (n = 206) received 2 IN doses of either saline or 1 of 3 different dose levels of vaccine (10^8 – 10^9 $TCID_{50}$), administered 28 days apart.

Results: Study vaccination was well-tolerated at all dose levels. A single 10^9 dose of A/Singapore/2016 M2SR generated significantly increased serum HAI responses compared to the 108 dose of A/Brisbane/10/2007 M2SR that had provided protection against infection & illness in an earlier human influenza challenge study (**Fig. 1**). HAI titers ≥40 were achieved in 0%, 23% & 58% of subjects after the first dose of placebo, 10^8 or 10^9 M2SR, respectively ($p< 0.003$). Increases also were stimulated in serum microneutralization titers (MNT) to drifted strains of H3N2 **(Fig 2)** & in serum NAI (**Fig 3**) and mucosal sIgA (**Fig 4**) titers. Further increases in serum and mucosal immune response were noted after a 2nd IN vaccination.

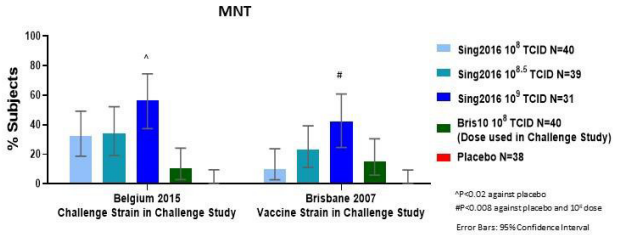
Proportion of subjects with seroprotective HAI titers after vaccination

Figure 1. Proportion of study subjects with HAI titers ≥ 40 at pre-vaccination (Day 1), and after first (Day 29) and second (Day 57) vaccinations for each study group shown in the Figure legend. Sing2016 = A/Singapore/INFIMH-16-0019/2016 H3N2 M2SR. Bris10 = A/Brisbane/10/2007 H3N2 M2SR.



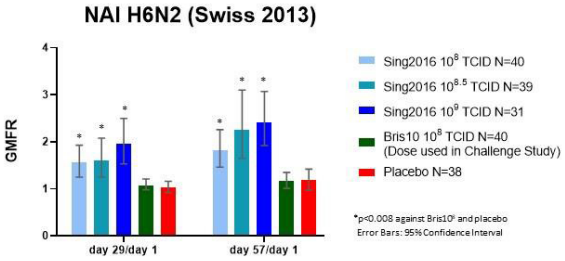
Proportion of subjects with increased microneutralization titers against drifted H3N2 viruses after vaccination

Figure 2. Proportion of study subjects with ≥4-fold increase in microneutralization titers (MNT) against drifted H3N2 viruses 28 days after first vaccination. Study group immunizations are shown in the figure legend (right) and MNT test strains are indicated below the X-axis



Geometric mean fold rise in serum neuraminidase inhibition antibody titers after vaccination

Figure 3. Geometric Mean Fold Rises (GMFR) in serum neuraminidase inhibition (NAI) titers following first (Day 29) and second (Day 57) immunizations for each study group shown in the legend. Sing2016 = A/Singapore/INFIMH-16-0019/2016 H3N2 M2SR. Bris10 = A/Brisbane/10/2007 H3N2 M2SR.



Conclusion: An earlier clinical trial with a 10^8 dose of M2SR provided protection against infection and illness upon challenge with a highly drifted strain of H3N2. Protection correlated with vaccine induced serum MNT responses. In the current study, a single, 10^9 dose of M2SR significantly increased serum MNT, HAI & NAI titers as well as mucosal immune responses among greater proportions of study subjects. Since HAI, alone, is a well-accepted surrogate marker for vaccine protection against influenza, these broader enhancements indicate the potential for M2SR to protect against both matched and drifted strains of influenza in a high proportion of adults and strongly support clinical assessment in younger and older age groups as well as development of multivalent M2SR.