Poster # 2134

# A Phase 2 Study to Evaluate the Safety, Tolerability, and Immunogenicity of a Booster Dose of a Group B Streptococcus 6-Valent Polysaccharide Conjugate Vaccine (GBS6)

Babalwa Jongihlati, MD, MBA[1], Nathan Segall, MD[2], Stanley L Block, MD[3], James T Peterson, MD[4], Judith Absalon, MD, MPH[5], Samantha Munson, MPH, MBA[1], Yasmin Sanchez-Pearson, PhD[5], Raphael Simon, PhD[1], Natalie C Silmon de Monerri, PhD[1], David Radley, MS[1], Emily Gomme, PhD[1], Michelle Gaylord, PhD[1], William C Gruber, MD[1], Daniel A Scott, MD[1], Annaliesa S Anderson, PhD[1] , Kathrin U Jansen, PhD[5]

[1]Vaccine Research and Development, Pfizer Inc., Pearl River, NY, [2]Clinical Research Atlanta, Stockbridge, GA, USA, [3]Kentucky Pediatric/Adult Research, Bardstown, KY, [4]J. Lewis Research, Salt Lake City, UT, [5]Previously at Pfizer Inc.

babalwa.jongihlati@pfizer.com
Funded by Pfizer Inc.

## INTRODUCTION

Group B streptococcus (GBS) is a leading cause of invasive bacterial infections in young infants and pregnant women.[1,2,3] Pfizer is developing a maternal GBS 6-valent capsular polysaccharide (CPS) conjugate vaccine (GBS6) to prevent invasive GBS disease due to the 6 most prevalent serotypes in young infants. We previously reported Phase 1/2 safety and immunogenicity data for GBS6 (NCT03170609).[4] The current study extends these results to determine whether individuals who received a primary dose of GBS6 have additional benefit following a booster dose.

There is a precedent for repeat doses of vaccines to augment or sustain circulating antibodies available for placental transfer with each pregnancy[5,6]; thus, data to inform GBS6 dosing strategies with subsequent pregnancies were required.

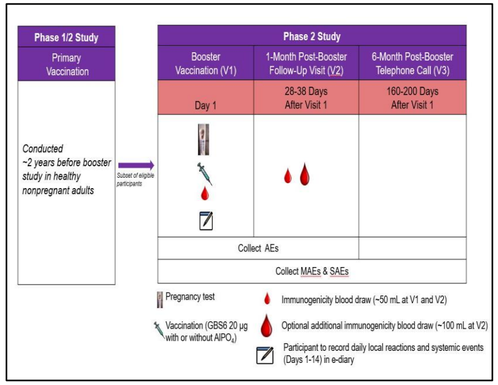
## METHODS

This Phase 2 open-label trial was conducted at 4 sites in the United States to assess the safety, tolerability, and immunogenicity of a single booster dose (20 µg CPS/serotype/dose) of GBS6 formulated with or without $AlPO_4$ (NCT04258995; Figure 1).

Healthy men and nonpregnant women who were 18-49 years of age during participation in the Phase 1/2 study approximately 2 years prior (NCT03170609) and received 1 of 6 GBS6 doses/formulations were enrolled.

Participants recorded solicited local reactions (injection site pain, redness, and swelling) and systemic events (fever, nausea/vomiting, diarrhea, headache, fatigue, muscle pain, and joint pain) for 14 days after vaccination and unsolicited safety events through 6 months after vaccination. Sera taken before and 1 month after the booster dose were assessed for immunogenicity (GBS CPS serotype-specific immunoglobulin G [IgG] levels) using a direct Luminex immunoassay. Serum samples from the Phase 1/2 study and this Phase 2 booster study were tested concurrently.

### Figure 1. Study Design



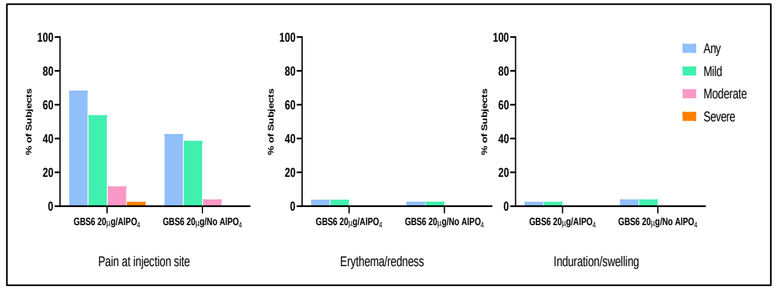

## RESULTS

Study population: 151 Participants received a booster dose of GBS6. The majority of participants were women (75.5%), White (82.8%), and non-Hispanic (93.4%), with a mean age of 36.7 years.

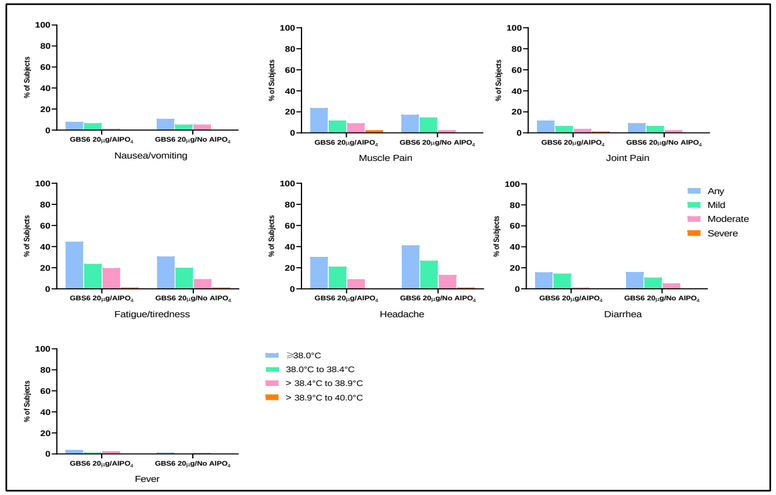
Safety and tolerability results: Both formulations of GBS6 were safe and well-tolerated (Figure 2, Figure 3, and Table 1). The most frequently reported local reaction was mild to moderate pain at the injection site. Pain was more frequent with the $AlPO_4$ formulation. Participants who received GBS6 with $AlPO_4$ reported more fatigue and muscle pain, while participants who received GBS6 without $AlPO_4$ reported numerically more headaches. The frequency of adverse events (AEs), serious AEs (SAEs), and severe AEs was low, and there were no vaccine-related AEs. There was 1 SAE, which was not considered related to the study intervention.

Immunogenicity results: The time points for serum collection from the Phase 1/2 study are referred to as “primary dose” and the time points from the current study are referred to as “booster dose” time points (Table 2). For all serotypes, serotype-specific IgG geometric mean concentrations (GMCs) remained elevated at the pre–booster dose time point (ie, Day 1 prior to booster dose) compared with before the primary dose and were 2- to 17-fold higher 1 month after the booster dose than 1 month after the primary dose. Both formulations induced similar responses (Table 3, Figure 4, and Figure 5).

### Figure 2. Local Reactions, by Maximum Severity




### Figure 3. Systemic Events, by Maximum Severity




### Table 1. Summary of All AEs

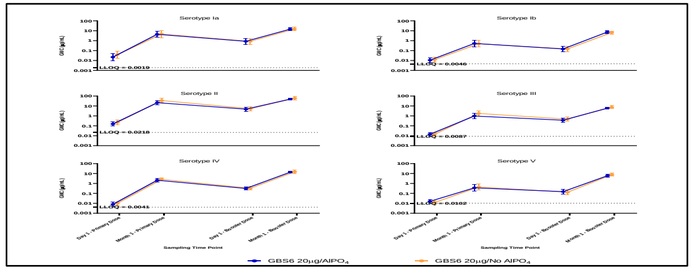
| | Vaccine Group (as Administered) | |
|---|---|---|
| | GBS6 20 µg/$AlPO_4$ (N=76) | GBS6 20 µg/No $AlPO_4$ (N=75) |
| **AE Category** | **n (%)** | **n (%)** |
| Any event | 11 (14.5) | 12 (16.0) |
| SAE* | 1 (1.3) | 0 |
| Immediate | 0 | 0 |
| Severe | 3 (3.9) | 2 (2.7) |
| Related | 0 | 0 |
| Medically attended | 9 (11.8) | 7 (9.3) |
| AE leading to withdrawal | 0 | 0 |

*SAE preferred term: Thermal burn.

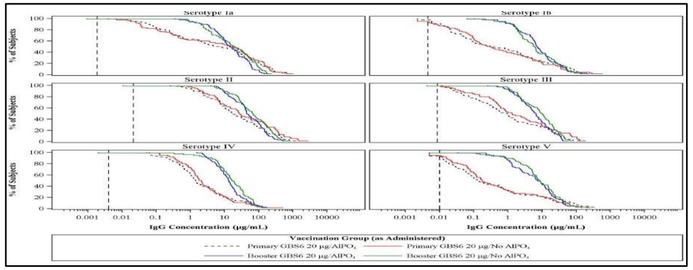
### Table 2. GBS Anti-CPS Serotype-Specific IgG GMC (µg/mL)

| | | Vaccine Group (as Administered) | |
|---|---|---|---|
| | | GBS6 20 µg/$AlPO_4$ (N=76) | GBS6 20 µg/No $AlPO_4$ (N=74) |
| **Serotype** | **Time Point** | **GMC (95% CI)** | **GMC (95% CI)** |
| Ia | Day 1 - Primary Dose | 0.022 (0.010, 0.047) | 0.038 (0.016, 0.087) |
| | Month 1 - Primary Dose | 4.423 (2.113, 9.256) | 4.658 (2.066, 10.502) |
| | Day 1 - Booster Dose | 0.859 (0.428, 1.724) | 0.859 (0.415, 1.781) |
| | Month 1 - Booster Dose | 14.429 (10.496, 19.836) | 15.070 (9.636, 23.567) |
| Ib | Day 1 - Primary Dose | 0.011 (0.006, 0.019) | 0.012 (0.007, 0.021) |
| | Month 1 - Primary Dose | 0.528 (0.248, 1.124) | 0.500 (0.238, 1.052) |
| | Day 1 - Booster Dose | 0.146 (0.075, 0.287) | 0.147 (0.076, 0.283) |
| | Month 1 - Booster Dose | 7.367 (5.206, 10.425) | 6.584 (4.587, 9.451) |
| II | Day 1 - Primary Dose | 0.154 (0.094, 0.253) | 0.221 (0.126, 0.389) |
| | Month 1 - Primary Dose | 21.435 (13.472, 34.104) | 35.173 (21.344, 57.963) |
| | Day 1 - Booster Dose | 4.793 (2.970, 7.737) | 5.274 (3.273, 8.500) |
| | Month 1 - Booster Dose | 49.834 (38.005, 65.344) | 60.304 (41.584, 87.453) |
| III | Day 1 - Primary Dose | 0.014 (0.009, 0.022) | 0.014 (0.009, 0.022) |
| | Month 1 - Primary Dose | 0.979 (0.539, 1.778) | 1.777 (0.969, 3.256) |
| | Day 1 - Booster Dose | 0.367 (0.222, 0.606) | 0.470 (0.288, 0.767) |
| | Month 1 - Booster Dose | 6.025 (4.572, 7.941) | 7.634 (5.379, 10.835) |
| IV | Day 1 - Primary Dose | 0.008 (0.005, 0.013) | 0.010 (0.006, 0.014) |
| | Month 1 - Primary Dose | 2.122 (1.334, 3.375) | 2.602 (1.719, 3.939) |
| | Day 1 - Booster Dose | 0.315 (0.210, 0.471) | 0.329 (0.220, 0.494) |
| | Month 1 - Booster Dose | 13.806 (10.811, 17.631) | 15.078 (10.432, 21.792) |
| V | Day 1 - Primary Dose | 0.016 (0.010, 0.024) | 0.012 (0.008, 0.018) |
| | Month 1 - Primary Dose | 0.365 (0.177, 0.753) | 0.439 (0.223, 0.867) |
| | Day 1 - Booster Dose | 0.150 (0.084, 0.270) | 0.130 (0.073, 0.232) |
| | Month 1 - Booster Dose | 6.033 (4.133, 8.808) | 7.755 (5.142, 11.695) |

### Figure 4. IgG GMCs for All Serotypes Increased Significantly After Booster Dose




### Figure 5. Reverse Cumulative Distribution Curves for IgG 1 Month After Primary Dose and Booster Dose




### Table 3. GBS Serotype-Specific IgG Geometric Mean Fold Rise (GMFR) From 1 Month After Primary Dose to 1 Month After Booster Dose

| | | Vaccine Group (as Administered) | |
|---|---|---|---|
| | | GBS6 20 µg/$AlPO_4$ (N=76) | GBS6 20 µg/No $AlPO_4$ (N=74) |
| **Serotype** | **Time Point** | **GMFR (95% CI)** | **GMFR (95% CI)** |
| Ia | Month 1 - Booster Dose | 3.262 (1.872, 5.685) | 3.315 (1.710, 6.426) |
| Ib | Month 1 - Booster Dose | 13.963 (7.895, 24.693) | 13.160 (7.731, 22.400) |
| II | Month 1 - Booster Dose | 2.325 (1.634, 3.309) | 1.714 (1.125, 2.613) |
| III | Month 1 - Booster Dose | 6.153 (3.599, 10.517) | 4.297 (2.473, 7.465) |
| IV | Month 1 - Booster Dose | 6.686 (4.424, 10.106) | 5.794 (3.799, 8.837) |
| V | Month 1 - Booster Dose | 16.509 (9.631, 28.299) | 17.654 (9.490, 32.841) |

## CONCLUSIONS

A booster dose of GBS6 given ~2 years after a primary dose to healthy nonpregnant adults was safe and elicited robust immune responses that were also consistently higher than the robust titers observed after the primary dose. The results demonstrated that participants who received a primary dose of GBS6 had additional benefit following a booster dose. This is analogous to vaccination during an initial pregnancy and subsequent pregnancies and suggests GBS6 vaccination with each pregnancy will be safe and provide enhanced protection against GBS disease.

**References:**
1. Verani JR, et al. MMWR Recomm Rep. 2010;59(RR10):1-36.
2. Johri AK, et al. Vaccine. 2013;31(Suppl 4):D43-5.
3. Centers for Disease Control and Prevention. https://www.cdc.gov/abcs/downloads/GBS_Surveillance_Report_2019.pdf. Accessed: 12 Sep 2022.
4. Absalon J, et al. Lancet Infect Dis. 2021;21(2):263-74.
5. Layton JB, et al. Vaccine. 2017;35(33):4072-8.
6. Morgan JL, et al. Obstet Gynecol. 2015;125(6):1433-8.

**Acknowledgments**: Medical writing support was provided by Mariam Khan, PharmD, of Pfizer Inc.

**Disclosures**: N. Segall, S. Block, and J. Peterson were investigators on Pfizer Inc.-sponsored studies. All other authors are employees or former employees of Pfizer Inc. and may hold stock or stock options.

**Presented at IDWeek 2022, October 19-23, 2022**