

Table S1. Wilcoxon-signed rank tests on the most abundant bacterial families before and after antibiotics administration, related to Figure 1.

Family	Percent Relative Abundance							
	Day -3 Mean (sd)	Day 0 Mean (sd) (p)	Day 1 Mean (sd) (p)	Day 3 Mean (sd) (p)	Day 7 Mean (sd) (p)	Day 30 Mean (sd) (p)	Day 90 Mean (sd) (p)	Day 180 Mean (sd) (p)
Lachnospiraceae	27.6 (8.94)	8.91 (13) (0.0113)	3.12 (4.54) (0.0092)	2.76 (5.36) (0.0080)	23.5 (20.7) (0.3983)	41 (19.9) (0.018)	28.3 (9.02) (0.625)	23.3 (9.25) (0.154)
Enterobacteriaceae	0.125 (0.219)	39.3 (43.2) (0.0113)	40.4 (40.2) (0.0092)	55.7 (41) (0.0249)	15.5 (19.4) (0.0067)	1.33 (1.61) (0.023)	0.27 (0.288) (0.083)	0.15 (0.147) (0.541)
Ruminococcaceae	27.3 (7.67)	8.29 (10.3) (0.0087)	3.74 (9.59) (0.0129)	3.57 (7.36) (0.0080)	7.42 (10.4) (0.0145)	13.8 (8.78) (0.029)	22 (14.6) (0.398)	23.1 (13.2) (0.359)
Streptococcaceae	0.988 (0.929)	18.9 (28.1) (0.0087)	28.1 (27.5) (0.0092)	16.7 (24.7) (0.0323)	3.99 (6.73) (0.6248)	1.1 (1.17) (1.000)	1.56 (1.88) (0.142)	0.47 (0.388) (0.067)
Bacteroidaceae	9.38 (8.38)	1.02 (1.91) (0.0067)	0.291 (0.48) (0.0244)	1 (2.83) (0.0323)	0.876 (2.36) (0.0051)	9.61 (13.9) (0.965)	13.3 (14.3) (0.351)	19 (15.9) (0.103)
Prevotellaceae	9.05 (14.6)	3.62 (7.53) (0.0454)	1.82 (4.67) (0.1925)	4.38 (11.1) (0.0415)	10 (14.3) (0.8241)	5.09 (11.2) (0.068)	7.11 (12.7) (0.351)	7.26 (12.1) (0.919)
Erysipelotrichaceae	7.24 (6.13)	4.79 (7.56) (0.3066)	2.53 (5.83) (0.0756)	2.71 (5.66) (0.0528)	3.1 (4.64) (0.0830)	5.87 (3.08) (0.625)	4.76 (3.02) (0.450)	7.81 (6.67) (0.308)
Veillonellaceae	3.35 (4)	1.48 (2.14) (0.0185)	0.978 (2.41) (0.0092)	1.74 (3.93) (0.0059)	3.7 (1.91) (0.3505)	2.28 (1.85) (0.398)	3.9 (4.41) (0.563)	3.33 (3.84) (0.760)

Table S2. Comparison of MN antibody titers before vaccination between phase 1 and phase 2, related to Figure 2.

Study Phase	No. of subjects enrolled	H1N1 geometric mean (range)	H3N2 geometric mean (range)	B geometric mean (range)
Phase 1	22	353.3 (159.7 – 781.4)	403.2 (230.6 – 704.8)	262.5 (135.3 – 509.4)
Phase 2	11	135.3 (13.95 – 89.12)	62.2 (28.31 – 136.6)	70.5 (30.81 – 161.5)

Table S4. Demographic information of study participants, related to STAR Methods.

Phase	Participants (no.)	Median Age (range)	Gender (%)	Race (%)
Phase 1	22	29 (24-38)	Male (64%) Female (36%)	White (54%) Black or African American (32%) Mix or other (14%)
Phase 2	11	28 (21-40)	Male (27%) Female (73%)	White (36%) Black or African American (55%) Mix or other (9%)

Table S5. Influenza virus strains contained in the vaccines, related to STAR Methods.

Phase	Vaccine Brand/Season	H1N1 strain	H3N2 strain	B strain
Phase 1	Fluzone 2014-2015	A/California/07/2009	A/Texas/50/2012	B/Massachusetts/02/2012
Phase 2	Fluzone 2015-2016	A/California/07/2009	A/Switzerland/9715293/2013 NIB-88	B/Phuket/3073/2013