**Supplementary Digital Content 6.** The mean relative abundance of otopathogens in the nasopharyngeal microbiome. *S. salivarius* K12 product was used for 30 days after study entry. Asterisk (\*) indicates P<0.05. The results do not present absolute bacterial counts. Microbiome results according to SILVA database are presented.

***S. salivarius* K12 Control 95 % CI of the difference P- value**

**Study entry**

All otopathogens % (SD) 36 (36) 40 (36) −12 to 20 0.63

*S. pneumoniae* 18 (32) 20 (34) −13 to 18 0.74

*H. influenzae* 2 (10) 0.1 (0.2) −4.6 to 0.05 0.11

*S. pyogenes* 0.01 (0.2) 0.04 (0.2) −0.1 to 0.0 0.36

*Moraxella*1 16 (25) 19 (23) −7.8 to 15 0.54

**At one month** (after intervention)

All otopathogens % (SD) 34 (36) 55 (40) 1.3 to 41 0.037\*

*S. pneumoniae* 15 (30) 23 (38) −10 to 25 0.40

*H. influenzae* 8.8 (24) 7.6 (23) −14 to 11 0.85

*S. pyogenes* 2.4 (14) 0.1 (0.2) −8.3 to 3.6 0.44

*Moraxella*17.8 (14) 25 (32) 2.6 to 32 0.023\*

**At two months** (one month after intervention)

All otopathogens % (SD)36 (35) 50 (40) −10 to 37 0.26

*S. pneumoniae* 15 (30) 13 (31) −21 to 18 0.86

*H. influenzae* 1.8 (7.3) 2.5 (9.0) −4.3 to 5.7 0.78

*S. pyogenes* 0.1 (0.4) 0.1 (0.1) −0.2 to 0.2 0.97

*Moraxella*120 (28) 34 (38) −9.8 to 38 0.23

1SILVA taxonomy reference database did not recognize *Moraxella catarrhalis* directly. After extracting other identified Moraxella species, Moraxella variable still likely contains commensals in addition to *M. catarrhalis*.

SD standard deviation