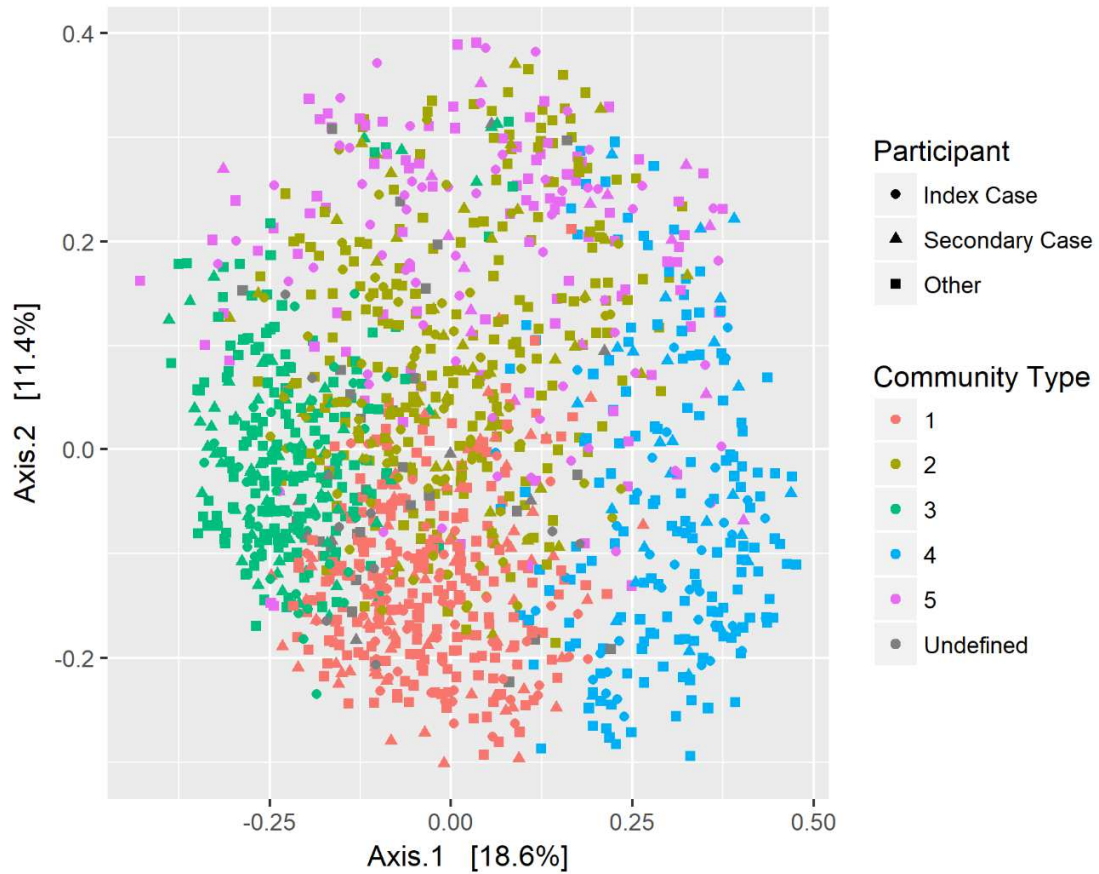


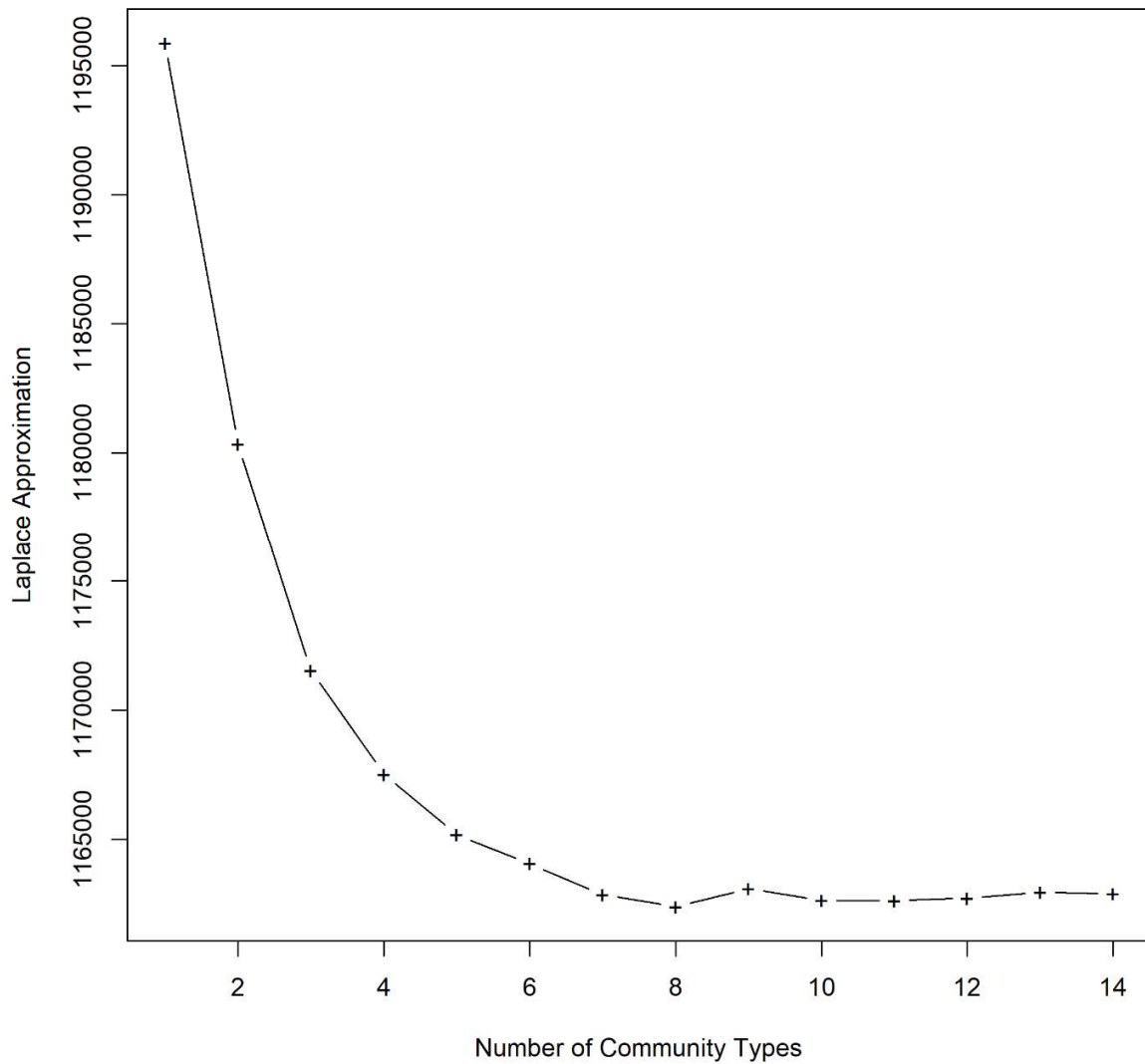
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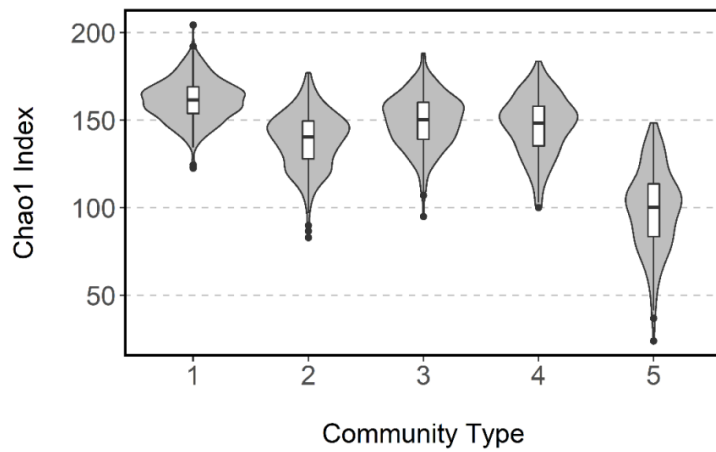
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Supplemental Figure 1. Principal coordinates analysis of nose/throat samples assigned to community types. 1,405 nose/throat samples from 717 study participants residing in 144 households in Managua, Nicaragua, 2012-2014. Based on Bray-Curtis dissimilarity.

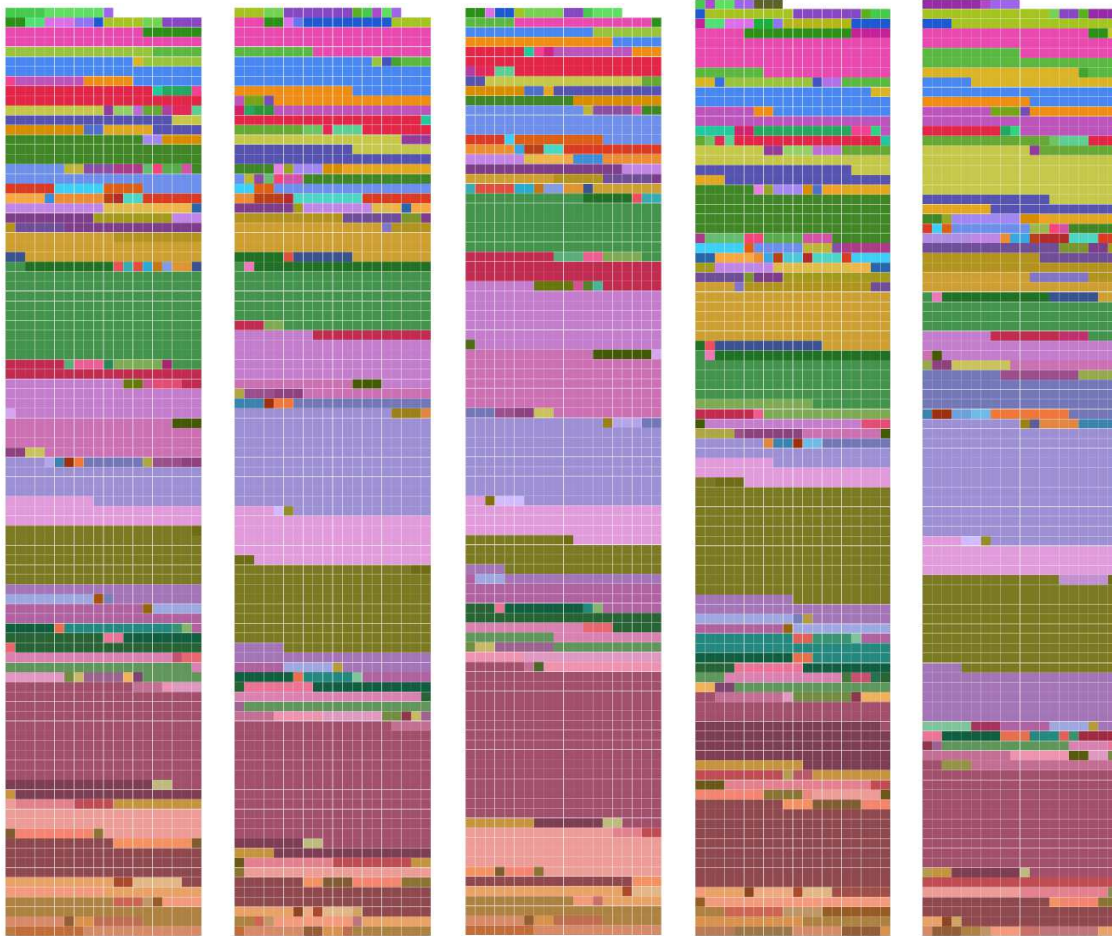


Supplemental Figure 2. Model fit of negative log models by number of Dirichlet components using the first and last samples of all study participants (n=1,405 samples). We determined the number of community types by estimating the Laplace approximation of the negative log models and identifying the point at which an increase in Dirichlet components resulted in minor reductions in model fit. Considerations were placed on statistical power in downstream analyses.



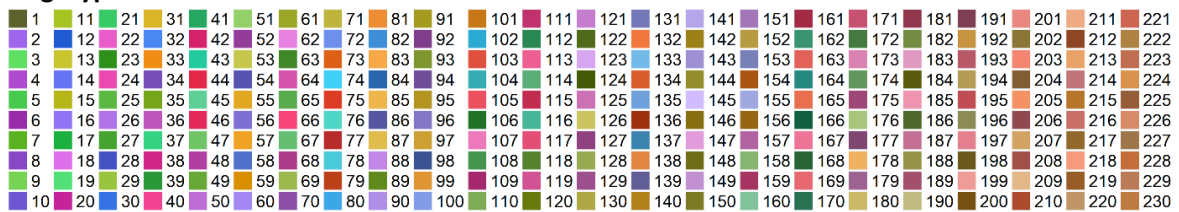
Supplemental Figure 3. Chao1 by community type types based on first and last nose/throat samples of 717 study participants from 144 households, Managua, Nicaragua, 2012-2014. Each violin plot contains a box plot with a kernel density estimation on each side depicting the distribution of data.

Community Type 1 n=343 Community Type 2 n=336 Community Type 3 n=282 Community Type 4 n=218 Community Type 5 n=181



1 square = 0.05% abundance

Oligotypes



Oligotype	CT 1 (%)	CT 2 (%)	CT 3 (%)	CT 4 (%)	CT 5 (%)	Taxonomy
1	9.87	12.4	15.55	2.22	10.6	<i>Veillonella dispar</i> / <i>Veillonella atypica</i> / <i>Veillonella parvula</i> / <i>Veillonella rogosae</i>
2	3.8	10.56	8.47	1.97	12.29	<i>Streptococcus vestibularis</i> / <i>Streptococcus salivarius</i> / <i>Streptococcus gordonii</i> / <i>Streptococcus</i> sp.
3	5.92	8.7	3.35	11.59	9.49	<i>Streptococcus</i> sp. / <i>Streptococcus dentisani</i> / <i>Streptococcus mitis</i> / <i>Streptococcus oralis</i> / <i>Streptococcus infantis</i> / <i>Streptococcus tigurinus</i>

Oligotype	CT 1 (%)	CT 2 (%)	CT 3 (%)	CT 4 (%)	CT 5 (%)	Taxonomy
						<i>Streptococcus lactarius</i> / <i>Streptococcus peroris</i> / <i>Streptococcus pneumoniae</i>
4	9.23	5.81	5.71	4.61	3.19	<i>Prevotella melaninogenica</i> / <i>Prevotella scopos</i> / <i>Prevotella sp.</i> / <i>Prevotella histicola</i> / <i>Prevotella veroralis</i>
5	3.6	4.65	6.33	0.82	2.27	<i>Prevotella histicola</i> / <i>Prevotella sp.</i> / <i>Prevotella veroralis</i> / <i>Prevotella scopos</i> / <i>Prevotella fusca</i> / <i>Prevotella melaninogenica</i>
6	3.66	2.73	0.91	8.4	2.44	<i>Neisseria subflava</i> / <i>Neisseria flavescens</i> / <i>Neisseria flava</i> / <i>Neisseria sicca</i> / <i>Neisseria pharyngis</i> / <i>Neisseria mucosa</i> / <i>Neisseria polysaccharea</i> / <i>Neisseria weaveri</i> / <i>Neisseria meningitidis</i> / <i>Neisseria lactamica</i>
7	3.68	1.27	6.22	0.45	0.61	<i>Prevotella sp.</i> / <i>Prevotella veroralis</i> / <i>Prevotella fusca</i> / <i>Prevotella histicola</i> / <i>Prevotella scopos</i> / <i>Prevotella melaninogenica</i>
8	2.46	3.16	0.82	5.53	1.69	<i>Haemophilus parainfluenzae</i> / <i>Haemophilus parahaemolyticus</i> / <i>Haemophilus paraphrohaemolyticus</i> / <i>Haemophilus sputorum</i> / <i>Haemophilus sp.</i> / <i>Haemophilus haemolyticus</i> / <i>Haemophilus influenzae</i>
9	2.81	0.88	0.68	4.62	0.37	<i>Fusobacterium periodonticum</i> / <i>Fusobacterium nucleatum subsp. animalis</i> / <i>Fusobacterium sp.</i> / <i>Fusobacterium nucleatum subsp. vincentii</i> / <i>Fusobacterium nucleatum subsp. polymorphum</i> / <i>Fusobacterium naviforme</i> / <i>Fusobacterium nucleatum subsp. nucleatum</i>
10	2.6	0.95	4.31	0.37	0.51	<i>Prevotella sp.</i> / <i>Prevotella veroralis</i> / <i>Prevotella histicola</i> / <i>Prevotella fusca</i> / <i>Prevotella scopos</i>
11	1.72	2.81	0.73	3.92	2.39	<i>Gemella haemolysans</i> / <i>Gemella sanguinis</i> / <i>Gemella morbillorum</i> / <i>Gemella bergeri</i>
12	1.72	1.18	0.39	4.42	0.35	<i>Veillonella parvula</i> / <i>Veillonella rogosae</i> / <i>Veillonella atypica</i> / <i>Veillonella denticariosi</i> / <i>Veillonella dispar</i>
13	2.49	5.1	3.57	2.15	3.26	<i>Streptococcus australis</i> / <i>Streptococcus parasanguinis II</i> / <i>Streptococcus parasanguinis I</i> / <i>Streptococcus sp.</i> / <i>Streptococcus oligofermentans</i> / <i>Streptococcus cristatus</i> / <i>Streptococcus sinensis</i> / <i>Streptococcus sanguinis</i> / <i>Streptococcus gordonii</i> / <i>Streptococcus lactarius</i> / <i>Streptococcus peroris</i> / <i>Streptococcus oralis</i>
14	1.67	0.86	2.89	0.28	0.43	<i>Megasphaera micronuciformis</i>
15	1.44	0.78	2.77	0.32	0.39	<i>Prevotella salivae</i>
16	1.47	1.74	1.02	1.92	5.3	<i>Streptococcus peroris</i> / <i>Streptococcus lactarius</i> / <i>Streptococcus sp.</i> / <i>Streptococcus tigurinus</i> / <i>Streptococcus infantis</i> / <i>Streptococcus dentisani</i> / <i>Streptococcus oralis</i> / <i>Streptococcus mitis</i>
17	1.78	0.63	2.36	0.63	0.29	<i>Leptotrichia sp.</i> / <i>Leptotrichia wadei</i>
18	1.1	1.62	0.66	1.65	1.35	<i>Granulicatella adiacens</i> / <i>Enterococcus italicus</i> / <i>Enterococcus faecalis</i>
19	2.04	3.12	0.99	2.52	1.72	<i>Rothia mucilaginosa</i>
20	1.78	1.33	2.08	0.8	0.63	<i>Actinomyces graevenitzii</i>
21	0.59	0.27	0.07	1.9	0.17	<i>Porphyromonas pasteri</i> / <i>Porphyromonas sp.</i> / <i>Porphyromonas catoniae</i>
22	1.88	0.52	1.86	0.62	0.11	<i>Prevotella pallens</i>
23	0.66	1.26	0.81	1.57	4.93	<i>Staphylococcus caprae</i> / <i>Staphylococcus epidermidis</i> / <i>Staphylococcus aureus</i> / <i>Staphylococcus warneri</i>
24	0.72	0.29	0.19	1.04	0.22	<i>Leptotrichia sp.</i>
25	0.18	0.42	0.1	0.4	1.23	<i>Veillonella sp.</i>
26	1.47	0.12	1.4	0.29	0.02	<i>Alloprevotella rava</i>
27	0.54	0.78	0.29	0.7	1.78	<i>Haemophilus sp.</i> / <i>Haemophilus haemolyticus</i> / <i>Haemophilus influenzae</i> / <i>Haemophilus aegyptius</i> / <i>Aggregatibacter sp.</i> / <i>Aggregatibacter segnis</i> / <i>Haemophilus parainfluenzae</i>

Oligotype	CT 1 (%)	CT 2 (%)	CT 3 (%)	CT 4 (%)	CT 5 (%)	Taxonomy
28	0.72	0.43	0.12	1.04	0.17	<i>Prevotella nanceiensis</i>
29	0.29	1.4	0.92	0.12	1	<i>Rothia mucilaginosa</i>
30	1.18	0.36	0.85	0.19	0.14	<i>Alloprevotella</i> sp.
31	0.27	0.42	0.1	0.42	0.7	<i>Granulicatella elegans</i>
32	0.25	0.4	0.11	0.57	0.99	<i>Alloprevotella</i> sp.
33	0.5	0.33	0.35	0.94	0.1	<i>Veillonella rogosae</i> / <i>Veillonella parvula</i> / <i>Veillonella atypica</i> / <i>Veillonella denticariosi</i> / <i>Veillonella dispar</i>
34	0.42	0.13	0.15	0.56	0.12	<i>Peptostreptococcus stomatis</i> / <i>Peptostreptococcus anaerobius</i>
35	1.07	0.69	1.11	0.27	0.22	<i>Leptotrichia</i> sp.
36	0.04	0.16	0.05	0.05	0.1	<i>Streptococcus</i> sp. / <i>Streptococcus gordonii</i> / <i>Streptococcus oligofermentans</i> / <i>Streptococcus sinensis</i> / <i>Streptococcus cristatus</i> / <i>Streptococcus parasanguinis</i> II / <i>Streptococcus parasanguinis</i> I / <i>Streptococcus australis</i> / <i>Streptococcus sanguinis</i> / <i>Streptococcus intermedius</i> / <i>Streptococcus salivarius</i> / <i>Streptococcus mitis</i> / <i>Streptococcus oralis</i>
37	0.49	0.31	0.74	0.08	0.12	<i>Atopobium parvulum</i> / <i>Atopobium rimae</i> / <i>Atopobium</i> sp.
38	0.08	0.45	0.12	0.29	0.19	<i>Streptococcus sanguinis</i> / <i>Streptococcus oligofermentans</i> / <i>Streptococcus sinensis</i> / <i>Streptococcus cristatus</i> / <i>Streptococcus australis</i> / <i>Streptococcus parasanguinis</i> II / <i>Streptococcus</i> sp. / <i>Streptococcus gordonii</i> / <i>Streptococcus parasanguinis</i> I / <i>Streptococcus pneumoniae</i> / <i>Streptococcus oralis</i> / <i>Streptococcus intermedius</i> / <i>Streptococcus mitis</i>
39	0.03	0.06	0.05	0.01	0.07	<i>Streptococcus vestibularis</i> / <i>Streptococcus salivarius</i> / <i>Streptococcus oligofermentans</i> / <i>Streptococcus sinensis</i> / <i>Streptococcus cristatus</i>
40	0.11	0.36	0.13	0.19	0.19	<i>Veillonella dispar</i> / <i>Veillonella atypica</i> / <i>Veillonella parvula</i> / <i>Veillonella rogosae</i>
41	0.09	0.2	0.13	0.05	0.18	<i>Actinomyces lingnae</i> [NVP] / <i>Actinomyces</i> sp. / <i>Actinomyces odontolyticus</i> / <i>Actinomyces meyeri</i> / <i>Actinomyces cardiffensis</i>
42	0.3	0.12	0.09	0.42	0.02	<i>Stomatobaculum</i> sp.
43	0.57	0.35	0.73	0.1	0.16	<i>Lachnoanaerobaculum orale</i> / <i>Lachnoanaerobaculum saburreum</i>
44	0.28	0.15	0.07	0.48	0.07	<i>Lachnoanaerobaculum umeaense</i> / <i>Lachnoanaerobaculum</i> sp.
45	0.49	1.14	0.28	0.96	0.59	<i>Neisseria pharyngis</i> / <i>Neisseria sicca</i> / <i>Neisseria mucosa</i> / <i>Neisseria flava</i> / <i>Neisseria subflava</i> / <i>Neisseria flavescens</i> / <i>Neisseria polysaccharea</i> / <i>Neisseria lactamica</i> / <i>Neisseria meningitidis</i> / <i>Neisseria gonorrhoeae</i> / <i>Neisseria oralis</i>
46	0.08	0.15	0.1	0.05	0.06	<i>Veillonella dispar</i> / <i>Veillonella atypica</i> / <i>Veillonella parvula</i> / <i>Veillonella rogosae</i> / <i>Veillonella denticariosi</i>
47	0.28	0.12	0.55	0.09	0.06	<i>Selenomonas</i> sp.
48	0.21	0.05	0.08	0.19	0.01	<i>Oribacterium parvum</i> / <i>Oribacterium sinus</i> / <i>Oribacterium asaccharolyticum</i>
49	0.96	0.98	1.19	0.65	0.24	<i>Actinomyces</i> sp. / <i>Actinomyces odontolyticus</i> / <i>Actinomyces meyeri</i> / <i>Actinomyces cardiffensis</i> / <i>Actinomyces lingnae</i> [NVP] / <i>Actinomyces georgiae</i>
50	0.41	0.09	0.04	0.65	0.08	<i>Alloprevotella</i> sp.
51	0.24	0.37	0.09	0.45	1.55	<i>Streptococcus pneumoniae</i> / <i>Streptococcus tigurinus</i> / <i>Streptococcus dentisani</i> / <i>Streptococcus</i> sp. / <i>Streptococcus oralis</i> / <i>Streptococcus mitis</i> / <i>Streptococcus infantis</i> / <i>Streptococcus peroris</i> / <i>Streptococcus lactarius</i>
52	1.05	0.06	0.39	0.5	0.01	<i>Alloprevotella tanneriae</i>
53	0.09	0.23	0.1	0.18	0.06	<i>Streptococcus sinensis</i> / <i>Streptococcus oligofermentans</i> / <i>Streptococcus cristatus</i> / <i>Streptococcus australis</i> / <i>Streptococcus</i>

Oligotype	CT 1 (%)	CT 2 (%)	CT 3 (%)	CT 4 (%)	CT 5 (%)	Taxonomy
						<i>parasanguinis</i> II / <i>Streptococcus</i> sp. / <i>Streptococcus gordonii</i> / <i>Streptococcus sanguinis</i> / <i>Streptococcus parasanguinis</i> I / <i>Streptococcus oralis</i> / <i>Streptococcus mitis</i> / <i>Streptococcus infantis</i>
54	0.15	0.06	0.02	0.32	0.02	<i>Prevotella shahii</i> / <i>Prevotella</i> sp.
55	0.11	0.13	0.11	0.02	0.05	<i>Veillonella dispar</i> / <i>Veillonella atypica</i> / <i>Veillonella parvula</i>
56	0.19	0.04	0.05	0.17	0.01	<i>Prevotella</i> sp.
57	0.27	0.56	0.27	0.6	1.68	<i>Dolosigranulum pigrum</i>
58	0.3	0.07	0.19	0.15	0.01	<i>Peptostreptococcaceae</i> [XI][G-1] [<i>Eubacterium</i>] <i>sulci</i> / <i>Peptostreptococcaceae</i> [XI][G-1] [<i>Eubacterium</i>] <i>infirmum</i>
59	0.1	0.04	0.24	0	0.02	<i>Prevotella</i> sp.
60	0.09	0.17	0.03	0.13	0.27	<i>Porphyromonas</i> sp.
61	0.11	0.03	0.03	0.21	0.04	<i>Peptococcus</i> sp.
62	0.14	0.39	0.15	0.32	1.06	Unclassified
63	0.29	0.11	0.24	1.24	0.03	<i>Prevotella melaninogenica</i> / <i>Prevotella scopos</i> / <i>Prevotella</i> sp. / <i>Prevotella histicola</i> / <i>Prevotella veroralis</i> / <i>Prevotella fusca</i>
64	0.05	0.14	0.05	0.06	0.09	<i>Actinomyces</i> sp. / <i>Actinomyces oris</i> / <i>Actinomyces naeslundii</i> / <i>Actinomyces johnsonii</i> / <i>Actinomyces viscosus</i> / <i>Actinomyces radidentis</i> / <i>Actinomyces meyeri</i>
65	0.16	0.03	0.01	0.34	0.03	<i>Fusobacterium periodonticum</i> / <i>Fusobacterium nucleatum</i> subsp. <i>animalis</i> / <i>Fusobacterium</i> sp. / <i>Fusobacterium nucleatum</i> subsp. <i>vincentii</i> / <i>Fusobacterium nucleatum</i> subsp. <i>polymorphum</i> / <i>Fusobacterium naviforme</i> / <i>Fusobacterium nucleatum</i> subsp. <i>nucleatum</i>
66	0.24	0.13	0.48	0.06	0.06	<i>Lachnospiraceae</i> [G-2] sp.
67	0.31	0.7	0.25	0.35	3.67	<i>Moraxella catarrhalis</i>
68	0.03	0.08	0.19	0.01	0.14	<i>Streptococcus vestibularis</i> / <i>Streptococcus salivarius</i>
69	0.15	0.1	0.04	0.53	0.06	<i>Capnocytophaga leadbetteri</i> / <i>Capnocytophaga</i> sp. / <i>Capnocytophaga ochracea</i>
70	0.22	0.38	0.15	0.38	0.11	<i>Oribacterium sinus</i> / <i>Oribacterium parvum</i>
71	0.07	0.1	0.02	0.11	0.19	<i>Porphyromonas</i> sp. / <i>Porphyromonas pasteri</i> / <i>Porphyromonas catoniae</i>
72	0.02	0.08	0.03	0.11	0.07	<i>Escherichia coli</i>
73	1.29	0.97	1.03	0.98	0.68	<i>Actinomyces</i> sp. / <i>Actinomyces odontolyticus</i> / <i>Actinomyces meyeri</i> / <i>Actinomyces cardiffensis</i> / <i>Actinomyces lingnae</i> [NVP] / <i>Actinomyces georgiae</i> / <i>Actinomyces gerencseriae</i> / <i>Actinomyces massiliensis</i>
74	0.18	0.34	0.06	0.58	0.25	<i>Haemophilus parahaemolyticus</i> / <i>Haemophilus sputorum</i> / <i>Haemophilus paraphrohaemolyticus</i> / <i>Haemophilus parainfluenzae</i>
75	0.35	0.87	0.43	1.34	1.89	Unclassified
76	0.2	0.13	0.33	0.02	0.06	<i>Stomatobaculum longum</i> / <i>Stomatobaculum</i> sp.
77	0.1	0.08	0.06	0.16	0.02	<i>Catonella morbi</i> / <i>Catonella</i> sp.
78	0.42	0.1	0.33	0.18	0.06	<i>Solobacterium moorei</i>
79	0.08	0.05	0.01	0.25	0.03	<i>Capnocytophaga gingivalis</i> / <i>Capnocytophaga granulosa</i> / <i>Capnocytophaga</i> sp.
80	0.13	0.14	0.24	0.05	0.06	<i>Oribacterium asaccharolyticum</i> / <i>Oribacterium parvum</i>
81	0.07	0.08	0.05	0.28	0.04	<i>Porphyromonas endodontalis</i> / <i>Porphyromonas</i> sp.
82	0.64	0.15	0.78	0.09	0.1	<i>Leptotrichia</i> sp.
83	0.65	0.37	0.53	0.31	0.18	<i>Campylobacter concisus</i> / <i>Campylobacter curvus</i>
84	0.15	0.07	0.12	0.07	0.04	<i>Actinomyces lingnae</i> [NVP] / <i>Actinomyces</i> sp. / <i>Actinomyces</i>

Oligotype	CT 1 (%)	CT 2 (%)	CT 3 (%)	CT 4 (%)	CT 5 (%)	Taxonomy
						<i>odontolyticus</i> / <i>Actinomyces meyeri</i>
85	0.08	0.04	0	0.21	1.59	<i>Rothia mucilaginosa</i>
86	0.07	0.24	0.08	0.23	0.1	<i>Lautropia mirabilis</i>
87	0.21	0.11	0.06	0.24	0.04	<i>Aggregatibacter sp.</i> / <i>Aggregatibacter segnis</i> / <i>Haemophilus haemolyticus</i> / <i>Haemophilus sp.</i> / <i>Haemophilus influenzae</i> / <i>Haemophilus aegyptius</i>
88	0.1	0.16	0.03	0.18	0.37	Unclassified
89	0.21	0.09	0.19	0.13	0.02	<i>Mogibacterium neglectum</i> / <i>Mogibacterium pumilum</i> / <i>Mogibacterium diversum</i> / <i>Mogibacterium vescum</i> / <i>Mogibacterium timidum</i>
90	0.04	0.03	0.01	0.12	0.03	<i>Bergeyella sp.</i>
91	0.05	0.09	0.01	0.05	0.12	<i>Porphyromonas sp.</i>
92	0.02	0.08	0.02	0.01	0.02	<i>Streptococcus vestibularis</i> / <i>Streptococcus salivarius</i>
93	0.02	0.05	0.09	0	0.01	<i>Streptococcus vestibularis</i> / <i>Streptococcus salivarius</i>
94	0.06	0.29	0.91	0	0.33	<i>Veillonella sp.</i>
95	0.03	0.07	0.04	0.07	0.09	<i>Streptococcus sp.</i> / <i>Streptococcus dentisani</i> / <i>Streptococcus mitis</i> / <i>Streptococcus oralis</i> / <i>Streptococcus infantis</i> / <i>Streptococcus tigurinus</i> / <i>Streptococcus lactarius</i> / <i>Streptococcus peroris</i> / <i>Streptococcus pneumoniae</i>
96	0.07	0.07	0.02	0.24	0.07	<i>Prevotella nanceiensis</i>
97	0.07	0.08	0.02	0.23	0.02	<i>Haemophilus pittmaniae</i> / <i>Aggregatibacter sp.</i> / <i>Aggregatibacter aphrophilus</i> / <i>Aggregatibacter paraphrophilus</i>
98	0.05	0.05	0.01	0.22	0.05	<i>Capnocytophaga sputigena</i> / <i>Capnocytophaga sp.</i>
99	0.06	0.15	0.04	0.11	0.07	<i>Abiotrophia defectiva</i>
100	0.03	0.01	0.01	0.12	0	<i>Parvimonas micra</i> / <i>Parvimonas sp.</i>
101	0.03	0.11	0.03	0.05	0.16	<i>Rothia dentocariosa</i> / <i>Rothia aeria</i>
102	0.09	0.05	0.03	0.23	0.04	<i>Fusobacterium sp.</i> / <i>Fusobacterium nucleatum subsp. animalis</i> / <i>Fusobacterium nucleatum subsp. polymorphum</i> / <i>Fusobacterium nucleatum subsp. nucleatum</i> / <i>Fusobacterium periodonticum</i> / <i>Fusobacterium nucleatum subsp. vincentii</i> / <i>Fusobacterium naviforme</i>
103	0.1	0.12	0.07	0.18	0.07	<i>Fusobacterium sp.</i> / <i>Fusobacterium nucleatum subsp. polymorphum</i> / <i>Fusobacterium nucleatum subsp. nucleatum</i> / <i>Fusobacterium naviforme</i> / <i>Fusobacterium nucleatum subsp. vincentii</i> / <i>Fusobacterium nucleatum subsp. animalis</i> / <i>Fusobacterium periodonticum</i>
104	0.05	0.02	0.07	0.01	0	<i>Oribacterium asaccharolyticum</i>
105	0.1	0.01	0.01	0.19	0	<i>SR1 [G-1] sp.</i>
106	0.02	0.03	0.02	0.16	0.02	<i>Filifactor alocis</i>
107	0.15	0.05	0.14	0.07	0.01	<i>Ruminococcaceae [G-2] sp.</i>
108	0.19	0.16	0.14	0.06	0.42	<i>Leptotrichia sp.</i>
109	0.15	0.04	0.07	0.12	0.01	<i>Ruminococcaceae [G-1] sp.</i>
110	0.13	0.11	0.11	0.62	0.02	<i>Prevotella intermedia</i>
111	0.02	0.08	0.02	0.02	0.06	<i>Leptotrichia shahii</i> / <i>Leptotrichia sp.</i> / <i>Leptotrichia hongkongensis</i>
112	0.02	0.09	0.02	0.05	0.07	<i>Rothia aeria</i> / <i>Rothia dentocariosa</i>
113	0.06	0.02	0.07	0.03	0.01	<i>Butyrivibrio sp.</i>
114	0.35	0.49	0.19	0.75	0.49	<i>Haemophilus parahaemolyticus</i> / <i>Haemophilus sputorum</i> / <i>Haemophilus paraphrohaemolyticus</i> / <i>Haemophilus parainfluenzae</i>

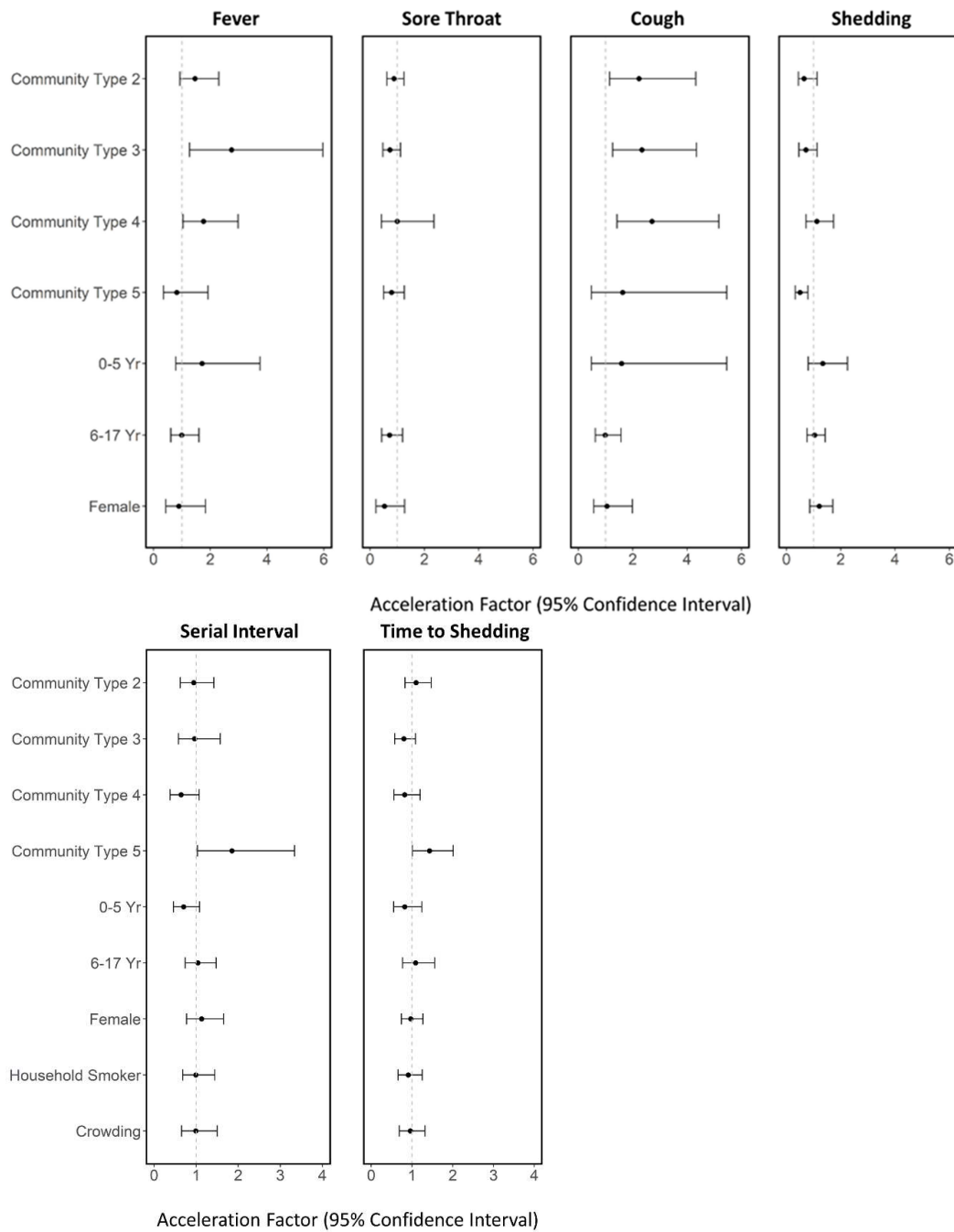
Oligotype	CT 1 (%)	CT 2 (%)	CT 3 (%)	CT 4 (%)	CT 5 (%)	Taxonomy
115	0.24	0.18	0.13	0.3	0.13	<i>Prevotella sp.</i> / <i>Prevotella scopos</i> / <i>Prevotella melaninogenica</i> / <i>Prevotella veroralis</i> / <i>Prevotella histicola</i> / <i>Prevotella fusca</i>
116	0.27	0.15	0.19	0.17	0.04	<i>Prevotella melaninogenica</i> / <i>Prevotella scopos</i> / <i>Prevotella sp.</i> / <i>Prevotella histicola</i> / <i>Prevotella veroralis</i> / <i>Prevotella fusca</i>
117	0.07	0.12	0.07	0.3	0.08	<i>Fusobacterium nucleatum subsp. vincentii</i> / <i>Fusobacterium naviforme</i> / <i>Fusobacterium nucleatum subsp. animalis</i> / <i>Fusobacterium nucleatum subsp. nucleatum</i> / <i>Fusobacterium sp.</i> / <i>Fusobacterium nucleatum subsp. polymorphum</i> / <i>Fusobacterium periodonticum</i>
118	0.04	0.09	0.02	0.06	0.08	<i>Kingella denitrificans</i> / <i>Neisseria elongata</i> / <i>Neisseria weaveri</i> / <i>Kingella sp.</i> / <i>Eikenella corrodens</i> / <i>Eikenella sp.</i>
119	0.08	0.11	0.07	0.23	0.19	<i>Prevotella nigrescens</i>
120	0.93	0.3	0.95	0.3	0.06	<i>Prevotella pallens</i>
121	0.07	0.08	0.05	0.15	0.07	<i>Fusobacterium nucleatum subsp. animalis</i> / <i>Fusobacterium naviforme</i> / <i>Fusobacterium nucleatum subsp. vincentii</i> / <i>Fusobacterium periodonticum</i> / <i>Fusobacterium sp.</i> / <i>Fusobacterium nucleatum subsp. nucleatum</i> / <i>Fusobacterium nucleatum subsp. polymorphum</i>
122	0.1	0	0	0.18	0	<i>SR1 [G-1] sp.</i>
123	0.06	0.01	0.1	0	0.01	<i>Prevotella sp.</i> / <i>Prevotella histicola</i> / <i>Prevotella veroralis</i> / <i>Prevotella scopos</i> / <i>Prevotella fusca</i> / <i>Prevotella melaninogenica</i>
124	0.65	0.94	0.42	0.98	0.32	<i>Rothia mucilaginosa</i>
125	0.06	0	0.01	0.13	0.02	<i>Campylobacter rectus</i> / <i>Campylobacter showae</i> / <i>Campylobacter gracilis</i>
126	0.07	0.05	0.12	0	0.01	<i>Stomatobaculum longum</i> / <i>Stomatobaculum sp.</i>
127	0.16	0.04	0.14	0.06	0.03	<i>Prevotella melaninogenica</i> / <i>Prevotella scopos</i> / <i>Prevotella sp.</i> / <i>Prevotella histicola</i> / <i>Prevotella veroralis</i> / <i>Prevotella fusca</i>
128	0.06	0.03	0.04	0.01	0.01	<i>Prevotella melaninogenica</i> / <i>Prevotella sp.</i> / <i>Prevotella histicola</i> / <i>Prevotella scopos</i> / <i>Prevotella veroralis</i> / <i>Prevotella fusca</i>
129	0.19	0.15	0.32	0.1	0.09	<i>Prevotella sp.</i> / <i>Prevotella scopos</i> / <i>Prevotella veroralis</i> / <i>Prevotella histicola</i> / <i>Prevotella fusca</i> / <i>Prevotella melaninogenica</i>
130	0.42	0.27	0.18	0.58	0.2	<i>Neisseria subflava</i> / <i>Neisseria flavescens</i> / <i>Neisseria flava</i> / <i>Neisseria sicca</i> / <i>Neisseria pharyngis</i> / <i>Neisseria mucosa</i> / <i>Neisseria polysaccharea</i> / <i>Neisseria weaveri</i>
131	0.09	0.04	0.18	0.01	0.02	<i>Prevotella veroralis</i> / <i>Prevotella sp.</i> / <i>Prevotella scopos</i> / <i>Prevotella fusca</i> / <i>Prevotella histicola</i> / <i>Prevotella melaninogenica</i>
132	0.27	0.33	0.26	0.35	1.12	<i>Haemophilus aegyptius</i> / <i>Haemophilus influenzae</i> / <i>Haemophilus sp.</i> / <i>Haemophilus haemolyticus</i> / <i>Aggregatibacter sp.</i> / <i>Aggregatibacter segnis</i>
133	0.03	0.05	0.02	0.09	0.01	<i>Campylobacter rectus</i> / <i>Campylobacter showae</i> / <i>Campylobacter gracilis</i>
134	0.05	0.02	0.06	0.01	0.01	<i>Prevotella histicola</i> / <i>Prevotella scopos</i> / <i>Prevotella sp.</i> / <i>Prevotella melaninogenica</i> / <i>Prevotella veroralis</i> / <i>Prevotella fusca</i>
135	0.01	0.05	0.04	0.09	0.05	Unclassified
136	0.07	0.01	0.16	0.01	0	<i>Prevotella histicola</i> / <i>Prevotella sp.</i> / <i>Prevotella veroralis</i> / <i>Prevotella fusca</i> / <i>Prevotella scopos</i> / <i>Prevotella melaninogenica</i>
137	0.05	0.09	0.03	0.05	0.06	<i>Corynebacterium matruchotii</i> / <i>Corynebacterium diphtheriae</i>
138	0.09	0.03	0.08	0.01	0.01	<i>Prevotella histicola</i> / <i>Prevotella melaninogenica</i> / <i>Prevotella sp.</i> / <i>Prevotella scopos</i> / <i>Prevotella veroralis</i>
139	0	0.01	0	0.01	0.18	<i>Veillonella sp.</i>
140	0.06	0.09	0.02	0.09	0.19	Unclassified
141	0.11	0.04	0.12	0.02	0.31	<i>Prevotella sp.</i> / <i>Prevotella scopos</i> / <i>Prevotella veroralis</i> / <i>Prevotella histicola</i> / <i>Prevotella fusca</i> / <i>Prevotella melaninogenica</i>
142	0.04	0.08	0.02	0.06	0.33	<i>Haemophilus sp.</i> / <i>Haemophilus haemolyticus</i> / <i>Haemophilus</i>

Oligotype	CT 1 (%)	CT 2 (%)	CT 3 (%)	CT 4 (%)	CT 5 (%)	Taxonomy
						<i>influenzae</i> / <i>Haemophilus aegyptius</i> / <i>Aggregatibacter sp.</i> / <i>Aggregatibacter segnis</i>
143	0.04	0.02	0.04	0.01	0.2	<i>Prevotella sp.</i> / <i>Prevotella scopos</i> / <i>Prevotella histicola</i> / <i>Prevotella melaninogenica</i> / <i>Prevotella veroralis</i> / <i>Prevotella fusca</i>
144	0.03	0.02	0.01	0.1	0.11	<i>Prevotella sp.</i>
145	0.2	0.06	0.21	0.05	0.04	<i>Atopobium parvulum</i> / <i>Atopobium sp.</i> / <i>Atopobium rimae</i>
146	0.02	0.05	0.02	0.11	0.03	<i>Treponema denticola</i> / <i>Treponema putidum</i> / <i>Treponema sp.</i>
147	0.03	0.03	0.04	0.13	0.05	<i>Alloprevotella tanneriae</i>
148	0.07	0.04	0.05	0.2	0.08	<i>Alloprevotella tanneriae</i>
149	0.02	0.05	0.03	0.06	0.1	<i>Fusobacterium nucleatum subsp. vincentii</i> / <i>Fusobacterium naviforme</i> / <i>Fusobacterium sp.</i> / <i>Fusobacterium nucleatum subsp. nucleatum</i> / <i>Fusobacterium nucleatum subsp. animalis</i> / <i>Fusobacterium nucleatum subsp. polymorphum</i> / <i>Fusobacterium periodonticum</i>
150	0.06	0.07	0.02	0.12	0.16	Unclassified
151	0.13	0.07	0.08	0.09	0.01	<i>Prevotella melaninogenica</i> / <i>Prevotella scopos</i> / <i>Prevotella sp.</i> / <i>Prevotella histicola</i> / <i>Prevotella veroralis</i>
152	0.07	0.04	0.02	0.14	0.02	<i>Capnocytophaga granulosa</i> / <i>Capnocytophaga sp.</i> / <i>Capnocytophaga gingivalis</i>
153	0.03	0.06	0.03	0.22	0.04	<i>Prevotella oris</i>
154	0.04	0.01	0.08	0	0.01	<i>Prevotella sp.</i>
155	0.01	0.1	0.02	0.1	0.04	Unclassified
156	0.05	0.05	0.05	0.08	0.01	<i>Prevotella veroralis</i> / <i>Prevotella sp.</i> / <i>Prevotella scopos</i> / <i>Prevotella fusca</i> / <i>Prevotella histicola</i>
157	0.05	0.08	0.02	0.08	0.26	Unclassified
158	0.03	0.03	0.05	0.05	0.1	<i>Selenomonas sputigena</i> / <i>Selenomonas sp.</i>
159	0.1	0.02	0.15	0.03	0	<i>Prevotella histicola</i> / <i>Prevotella sp.</i> / <i>Prevotella veroralis</i> / <i>Prevotella fusca</i> / <i>Prevotella scopos</i> / <i>Prevotella melaninogenica</i>
160	0.03	0.06	0.04	0.08	0.05	<i>Prevotella denticola</i> / <i>Prevotella multiformis</i>
161	0.15	0.01	0.19	0.03	0	<i>Alloprevotella rava</i>
162	0.06	0.02	0.09	0.04	0.01	<i>Leptotrichia sp.</i> / <i>Leptotrichia wadei</i>
163	0.04	0.01	0	0.27	0	<i>Leptotrichia sp.</i>
164	0.04	0.07	0.02	0.03	0.09	<i>Neisseria subflava</i> / <i>Neisseria flavescens</i> / <i>Neisseria flava</i> / <i>Neisseria sicca</i> / <i>Neisseria pharyngis</i> / <i>Neisseria mucosa</i> / <i>Neisseria polysaccharea</i> / <i>Neisseria weaveri</i>
165	0.02	0.05	0.05	0.04	0.06	<i>Streptococcus anginosus</i> / <i>Streptococcus constellatus</i> / <i>Streptococcus intermedius</i>
166	0.01	0.02	0.02	0.09	0.07	<i>Parvimonas micra</i> / <i>Parvimonas sp.</i>
167	0.11	0.37	0.05	0.36	0.17	<i>Rothia mucilaginosa</i>
168	0.04	0.04	0.02	0.07	0.04	<i>Alloprevotella tanneriae</i>
169	0.02	0.05	0.03	0.06	0.23	<i>Streptococcus constellatus</i> / <i>Streptococcus intermedius</i> / <i>Streptococcus anginosus</i> / <i>Streptococcus gordonii</i> / <i>Streptococcus sp.</i>
170	0.02	0.02	0	0.01	0.17	Unclassified
171	0.04	0.03	0.1	0.02	0	<i>Prevotella salivae</i>
172	0.02	0.05	0.01	0.05	0.11	<i>Prevotella sp.</i>
173	0.04	0.01	0.01	0.12	0	<i>Leptotrichia sp.</i>
174	0.04	0.01	0.05	0.06	0	<i>Alloprevotella rava</i>
175	0.08	0.03	0.02	0.06	0.02	<i>Leptotrichia sp.</i>

Oligotype	CT 1 (%)	CT 2 (%)	CT 3 (%)	CT 4 (%)	CT 5 (%)	Taxonomy
176	0.04	0	0	0.35	0	<i>Leptotrichia sp.</i>
177	0	0.02	0	0	0.21	<i>Unclassified</i>
178	0.1	0.03	0.01	0.12	0	<i>Leptotrichia sp.</i>
179	0.12	0.02	0.03	0.08	0	<i>Leptotrichia sp.</i>
180	0.07	0.03	0.18	0	0.02	<i>Mitsuokella sp.</i>
181	0.01	0.09	0.04	0.07	0.03	<i>Unclassified</i>
182	0.02	0	0	0.32	0	<i>Prevotella aurantiaca</i>
183	0.04	0.05	0.03	0.03	0.08	<i>Alloprevotella sp.</i>
184	0.39	0.09	0.36	0.05	0.03	<i>Prevotella aurantiaca</i>
185	0	0.02	0	0	0.14	<i>Atopobium parvulum / Atopobium rimae / Atopobium sp.</i>
186	0.08	0.03	0.13	0.02	0.02	<i>Prevotella sp. / Prevotella oulorum</i>
187	0.02	0.07	0.03	0.09	0.1	<i>Unclassified</i>
188	0	0	0	0	0.02	<i>Acinetobacter baumannii / Acinetobacter sp.</i>
189	0.13	0.03	0.14	0.01	0.03	<i>Prevotella sp. / Prevotella oulorum</i>
190	0	0.02	0.01	0	0.07	<i>Streptococcus mutans</i>
191	0.29	0.08	0.29	0.02	0.03	<i>Prevotella pallens</i>
192	0.05	0.05	0.03	0.05	0.09	<i>Unclassified</i>
193	0.17	0.09	0.05	0.16	0.01	<i>Leptotrichia sp.</i>
194	0.04	0.05	0.02	0.08	0	<i>Unclassified</i>
195	0.04	0.07	0.02	0.04	0.34	<i>Neisseria lactamica / Neisseria sicca / Neisseria flava / Neisseria polysaccharea / Neisseria pharyngis / Neisseria mucosa / Neisseria meningitidis / Neisseria oralis / Neisseria subflava / Neisseria bacilliformis / Neisseria gonorrhoeae / Neisseria flavescens</i>
196	0	0	0	0	0.27	<i>Leptotrichia sp.</i>
197	0.07	0.04	0.1	0.01	0.03	<i>Prevotella sp. / Prevotella oulorum</i>
198	0.02	0	0	0.23	0	<i>Prevotella aurantiaca</i>
199	0.02	0.14	0.03	0.09	0.17	<i>Prevotella sp.</i>
200	0.09	0.02	0.01	0.43	0.04	<i>Unclassified</i>
201	0.06	0.11	0.04	0.01	0.4	<i>Moraxella catarrhalis</i>
202	0	0	0	0	0.01	<i>Enterococcus faecalis / Enterococcus durans / Enterococcus saccharolyticus / Enterococcus casseliflavus / Enterococcus italicus / Granulicatella adiacens</i>
203	0.08	0.02	0.09	0.01	0.01	<i>Prevotella oulorum / Prevotella sp.</i>
204	0.07	0.05	0.2	0.01	0.02	<i>Prevotella sp. / Prevotella veroralis / Prevotella histicola / Prevotella fusca / Prevotella scopos</i>
205	0.05	0.03	0.01	0.07	0.01	<i>Leptotrichia sp.</i>
206	0	0.01	0	0.01	0.02	<i>Lactobacillus gasseri / Lactobacillus johnsonii</i>
207	0.08	0.02	0.02	0	0	<i>Prevotella sp. / Prevotella melaninogenica / Prevotella histicola / Prevotella veroralis / Prevotella scopos / Prevotella fusca</i>
208	0	0.03	0.09	0	0.01	<i>Veillonella sp.</i>
209	0.02	0.09	0.04	0.24	0.01	<i>Haemophilus parahaemolyticus / Haemophilus sputorum / Haemophilus paraphrohaemolyticus / Haemophilus parainfluenzae</i>
210	0	0	0	0	0	<i>Bacillus anthracis / Lysinibacillus fusiformis</i>
211	0.06	0.01	0.04	0.02	0	<i>Prevotella aurantiaca / Prevotella pallens</i>
212	0.02	0.04	0.01	0.01	0.05	<i>Prevotella sp.</i>

Oligotype	CT 1 (%)	CT 2 (%)	CT 3 (%)	CT 4 (%)	CT 5 (%)	Taxonomy
213	0.13	0.15	0.06	0.25	0.02	<i>Neisseria subflava</i> / <i>Neisseria flavescens</i> / <i>Neisseria flava</i> / <i>Neisseria sicca</i> / <i>Neisseria pharyngis</i> / <i>Neisseria mucosa</i>
214	0	0.12	0	0	0	Unclassified
215	0	0	0	0	0	<i>Bacillus subtilis</i>
216	0.08	0.04	0.01	0.02	0.01	<i>Leptotrichia</i> sp.
217	0	0	0	0	0.27	<i>Pseudomonas aeruginosa</i> / <i>Pseudomonas otitidis</i> / <i>Pseudomonas</i> sp.
218	0.03	0	0.01	0.32	0	<i>Neisseria subflava</i> / <i>Neisseria flavescens</i> / <i>Neisseria flava</i> / <i>Neisseria sicca</i> / <i>Neisseria pharyngis</i> / <i>Neisseria mucosa</i> / <i>Neisseria polysaccharea</i> / <i>Neisseria weaveri</i>
219	0	0.01	0	0.01	0.26	<i>Streptococcus agalactiae</i> / <i>Streptococcus pyogenes</i>
220	0	0	0	0.07	0	<i>Bordetella pertussis</i> / <i>Achromobacter xylosoxidans</i>
221	0.05	0.01	0.04	0.01	0	<i>Prevotella</i> sp. / <i>Prevotella veroralis</i> / <i>Prevotella histicola</i> / <i>Prevotella fusca</i> / <i>Prevotella scopos</i>
222	0.05	0.01	0.06	0.01	0.12	Unclassified
223	0	0	0	0	0	<i>Listeria monocytogenes</i>
224	0	0.01	0.02	0.01	0	<i>Streptococcus pyogenes</i> / <i>Streptococcus agalactiae</i>
225	0	0	0	0	0	Unclassified
226	0	0.04	0	0	0.12	<i>Fusobacterium necrophorum</i> / <i>Fusobacterium gonidiaformans</i>
227	0	0	0	0	0.46	Unclassified
228	0	0	0	0	0	<i>Helicobacter pylori</i>
229	0	0	0	0	0	<i>Neisseria meningitidis</i> / <i>Neisseria polysaccharea</i> / <i>Neisseria flava</i> / <i>Neisseria gonorrhoeae</i> / <i>Neisseria sicca</i> / <i>Neisseria pharyngis</i> / <i>Neisseria mucosa</i> / <i>Neisseria lactamica</i> / <i>Neisseria flavescens</i> / <i>Neisseria subflava</i>
230	0	0	0	0	0	Unclassified

Supplemental Figure 4. Relative abundance of oligotypes by community type. Based on first and last nose/throat samples of 717 study participants from 144 households, Managua, Nicaragua, 2012-2014. Each square represents 0.05% relative abundance.



Supplemental Figure 5. Accelerated failure time models assessing impact of community types on outcomes of interest among 124 secondary cases from 70 households, Managua, Nicaragua, 2012-2014. Models are not specific to influenza type/subtype. Children 0 to 5 years of age were removed from the sore throat model as young children are not able to reliably report sore throat.

Supplementary Table 1. Summary of accelerated failure time models used to investigate the relationship between the nose/throat microbiota and various symptom and viral shedding outcomes. Models additionally controlled for clustering by household and were not specific to influenza type/subtype. Columns to the right of the bold vertical line indicate independent variables included in the model. Models were rerun using community types and log₁₀-transformed relative abundance of 15 oligotypes that contributed to 50% of difference between community types.

Model	Community diversity	Age	Sex	Smoker in household	Crowding
Symptom duration	Yes	Yes	Yes	No	No
Shedding duration	Yes	Yes	Yes	No	No
Serial interval	Yes	Yes	Yes	Yes	Yes
Time to shedding onset	Yes	Yes	Yes	Yes	Yes

Supplemental Table 2. Accelerated failure time models estimating association between alpha diversity and symptom duration. Among 124 secondary cases from 70 households, Managua, Nicaragua, 2012-2014.

Outcome	Shannon Diversity	Chao1 Index
	Acceleration Factor (95% Confidence Interval)	
Duration of fever	0.80 (0.31, 2.07)	1.00 (0.99, 1.01)
Duration of runny nose	1.87 (0.67, 5.24)	1.01 (0.996, 1.03)
Duration of sore throat	1.01 (0.55, 1.85)	1.00 (0.99, 1.01)
Duration of cough	1.39 (0.56, 3.49)	1.00 (0.99, 1.02)

Supplemental Table 3. Accelerated failure time models estimating the association between alpha diversity and shedding and time to infection. Among 124 secondary cases from 70 households, Managua, Nicaragua, 2012-2014.

Model	Shedding duration	Serial Interval	Time to shedding onset
	Acceleration Factor (95% CI)		
Shannon diversity	1.61 (1.24, 2.10)	0.72 (0.53, 0.97)	0.85 (0.68, 1.07)
<5 yrs	1.04 (0.64, 1.69)	0.72 (0.49, 1.05)	0.87 (0.62, 1.21)
6-17 yrs	0.95 (0.66, 1.37)	1.09 (0.76, 1.56)	0.98 (0.72, 1.31)
Female	1.06 (0.77, 1.47)	1.02 (0.73, 1.42)	0.92 (0.73, 1.15)
Smoker in household	-	0.95 (0.65, 1.47)	0.86 (0.62, 1.19)
Household crowding	-	0.93 (0.63, 1.38)	1.04 (0.77, 1.40)
Chao1 index	1.01 (0.999, 1.01)	0.99 (0.99, 0.998)	0.99 (0.99, 0.999)
<5 yrs	1.08 (0.60, 1.96)	0.66 (0.45, 0.95)	0.75 (0.51, 1.11)
6-17 yrs	0.98 (0.67, 1.43)	1.05 (0.74, 1.48)	0.91 (0.68, 1.21)
Female	1.09 (0.78, 1.52)	1.02 (0.73, 1.43)	0.89 (0.71, 1.12)
Smoker in household	-	0.95 (0.65, 1.47)	0.86 (0.64, 1.17)
Household crowding	-	0.93 (0.63, 1.38)	1.10 (0.80, 1.50)

Supplemental Table 4. Single oligotypes models using log₁₀-transformed relative abundance of 15 oligotypes that contributed 50% of difference between community types. Benjamin-Hochberg method to correct for multiple testing. Among 124 secondary cases from 70 households, Managua, Nicaragua, 2012-2014.

Oligotype	Fever duration		Runny nose duration	
	AF (95% CI)	q-value ^a	AF (95% CI)	q-value ^a
<i>Veillonella 1</i>	1.20 (0.82, 1.75)	0.409	1.27 (0.89, 1.81)	0.564
<i>Streptococcus 1</i>	1.34 (0.83, 2.17)	0.409	0.98 (0.49, 1.95)	0.945
<i>Fusobacterium</i>	0.89 (0.64, 1.23)	0.772	1.30 (1.09, 1.55)	0.020
<i>Streptococcus 2</i>	1.04 (0.51, 2.09)	0.912	0.40 (0.16, 1.03)	0.214
<i>Prevotella 1</i>	1.05 (0.89, 1.25)	0.730	0.97 (0.82, 1.15)	0.945
<i>Gemella</i>	0.64 (0.42, 0.99)	0.200	0.97 (0.47, 2.00)	0.945
<i>Neisseria</i>	0.85 (0.65, 1.11)	0.730	1.41 (1.25, 1.60)	<0.001
<i>Haemophilus</i>	0.64 (0.42, 0.98)	0.285	1.09 (0.42, 2.87)	0.945
<i>Prevotella 2</i>	1.12 (0.96, 1.31)	0.409	1.08 (0.83, 1.39)	0.874
<i>Prevotella 3</i>	1.23 (1.03, 1.48)	0.200	1.31 (0.92, 1.40)	0.625
<i>Prevotella 4</i>	1.10 (0.71, 1.70)	0.772	2.01 (1.46, 2.75)	<0.001
<i>Streptococcus 3</i>	1.22 (0.74, 2.01)	0.648	1.36 (0.46, 4.00)	0.874
<i>Megasphaera</i>	1.02 (0.91, 1.14)	0.772	1.06 (0.95, 1.18)	0.718
<i>Prevotella 5</i>	1.09 (0.91, 1.31)	0.648	1.01 (0.80, 1.28)	0.945
<i>Veillonella 2</i>	0.66 (0.50, 0.86)	0.030	0.88 (0.63, 1.25)	0.874
Oligotype	Sore throat duration ^b		Cough duration	
	AF (95% CI)	q-value ^a	AF (95% CI)	q-value ^a
<i>Veillonella 1</i>	0.95 (0.51, 1.79)	0.990	0.81 (0.47, 1.40)	0.759
<i>Streptococcus 1</i>	1.00 (0.58, 1.73)	0.990	0.69 (0.39, 1.22)	0.621
<i>Fusobacterium</i>	1.23 (0.96, 1.57)	0.291	1.33 (1.02, 1.72)	0.255
<i>Streptococcus 2</i>	1.30 (0.63, 2.70)	0.894	0.63 (0.28, 1.40)	0.621
<i>Prevotella 1</i>	0.99 (0.55, 1.78)	0.990	0.84 (0.64, 1.09)	0.621
<i>Gemella</i>	1.12 (0.62, 2.01)	0.976	0.85 (0.51, 1.42)	0.782
<i>Neisseria</i>	0.85 (0.60, 1.20)	0.774	1.37 (1.03, 1.82)	0.292
<i>Haemophilus</i>	1.52 (0.88, 2.65)	0.340	1.27 (0.78, 2.06)	0.694
<i>Prevotella 2</i>	1.17 (0.98, 1.39)	0.291	0.92 (0.73, 1.14)	0.759
<i>Prevotella 3</i>	1.27 (1.13, 1.42)	<0.001	1.06 (0.84, 1.33)	0.782
<i>Prevotella 4</i>	1.22 (0.60, 2.49)	0.963	1.42 (0.88, 2.29)	0.621
<i>Streptococcus 3</i>	1.11 (0.64, 1.92)	0.976	0.79 (0.35, 1.78)	0.782
<i>Megasphaera</i>	1.14 (1.04, 1.24)	0.020	0.98 (0.86, 1.13)	0.844
<i>Prevotella 5</i>	1.22 (1.07, 1.39)	0.015	0.97 (0.79, 1.19)	0.844
<i>Veillonella 2</i>	1.02 (0.72, 1.44)	0.990	0.83 (0.62, 1.12)	0.621

Oligotype	Shedding duration		Serial Interval		Time to shedding onset	
	AF (95% CI)	q-value ^a	AF (95% CI)	q-value ^a	AF (95% CI)	q-value ^a
<i>Veillonella 1</i>	0.83 (0.67, 1.02)	0.171	1.31 (0.98, 1.74)	0.255	1.16 (0.89, 1.50)	0.528
<i>Streptococcus 1</i>	0.61 (0.49, 0.77)	<0.001	1.02 (0.74, 1.40)	0.920	0.88 (0.70, 1.12)	0.528
<i>Fusobacterium</i>	1.14 (1.06, 1.23)	0.002	0.89 (0.83, 0.95)	0.015	0.97 (0.93, 1.02)	0.528
<i>Streptococcus 2</i>	1.25 (0.85, 1.84)	0.353	1.07 (0.79, 1.44)	0.773	0.94 (0.61, 1.46)	0.845
<i>Prevotella 1</i>	0.86 (0.69, 1.07)	0.286	0.97 (0.79, 1.20)	0.840	0.97 (0.90, 1.04)	0.528
<i>Gemella</i>	1.16 (0.87, 1.55)	0.399	1.31 (0.91, 1.89)	0.362	1.23 (0.88, 1.71)	0.528
<i>Neisseria</i>	1.16 (1.06, 1.27)	0.009	0.87 (0.79, 0.95)	0.015	0.97 (0.90, 1.04)	0.598
<i>Haemophilus</i>	1.13 (1.04, 1.23)	0.023	0.93 (0.68, 1.26)	0.773	1.01 (0.96, 1.07)	0.772
<i>Prevotella 2</i>	1.05 (0.94, 1.17)	0.430	0.92 (0.83, 1.01)	0.255	0.93 (0.87, 1.00)	0.360

<i>Prevotella 3</i>	1.04 (0.90, 1.21)	0.570	1.07 (0.92, 1.25)	0.554	0.98 (0.91, 1.05)	0.693
<i>Prevotella 4</i>	1.21 (0.97, 1.52)	0.171	0.81 (0.63, 1.03)	0.384	0.90 (0.79, 1.03)	0.528
<i>Streptococcus 3</i>	0.59 (0.39, 0.91)	0.049	0.88 (0.66, 1.19)	0.255	0.84 (0.62, 1.13)	0.528
<i>Megasphaera</i>	0.97 (0.88, 1.06)	0.553	1.07 (0.96, 1.18)	0.409	0.99 (0.92, 1.07)	0.872
<i>Prevotella 5</i>	1.10 (0.99, 1.24)	0.171	0.94 (0.72, 1.22)	0.773	0.94 (0.89, 1.00)	0.360
<i>Veillonella 2</i>	1.10 (0.95, 1.27)	0.294	0.86 (0.66, 1.12)	0.435	0.97 (0.88, 1.06)	0.680

Oligotype	Full taxonomic classification
<i>Veillonella 1</i>	<i>Veillonella dispar / atypica / parvula / rogosae</i>
<i>Streptococcus 1</i>	<i>Streptococcus vestibularis / salivarius / gordonii / sp</i>
<i>Fusobacterium</i>	<i>Fusobacterium periodonticum / nucleatum subsp. animalis / sp. / nucleatum subsp. Vincentii / nucleatum subsp. polymorphum / naviforme / nucleatum subsp. nucleatum</i>
<i>Streptococcus 2</i>	<i>Streptococcus sp. / dentisani / mitis / oralis / infantis / tigurinus / lactarius / peroris / pneumoniae</i>
<i>Prevotella 1</i>	<i>Prevotella histicola / sp. / veroralis / scopos / fusca / melaninogenica</i>
<i>Gemella</i>	<i>Gemella haemolysans / sanguinis / morbillorum / bergeri</i>
<i>Neisseria</i>	<i>Neisseria subflava / flavescens / flava / sicca / pharynges / mucosa / polysaccharea / weaver / meningitidis / lactamica</i>
<i>Haemophilus</i>	<i>Haemophilus parainfluenzae / parahaemolyticus / paraphrohaemolyticus / sputorum / sp. / haemolyticus / influenzae</i>
<i>Prevotella 2</i>	<i>Prevotella sp. / veroralis / histicola / fusca / scopos</i>
<i>Prevotella 3</i>	<i>Prevotella sp. / veroralis / fusca / histicola / scopos / melaninogenica</i>
<i>Prevotella 4</i>	<i>Prevotella melaninogenica / scopos / sp. / histicola / veroralis</i>
<i>Streptococcus 3</i>	<i>Streptococcus australis / parasanguinis II / parasanguinis I / sp. / oligofermentans / cristatus / sinensis / sanguinis / gordonii / lactarius / peroris / oralis</i>
<i>Megasphaera</i>	<i>Megasphaera micronuciformis</i>
<i>Prevotella 5</i>	<i>Prevotella salivae</i>
<i>Veillonella 2</i>	<i>Veillonella parvula / rogosae / atypica / denticariosi / dispar</i>

^aCorrected for multiple testing using the Benjamin-Hochberg method.

^bChildren 0-5 years of age were removed from the sore throat model as they cannot reliably report the symptom.

Supplemental Table 5. Sensitivity analysis using alternative definitions of illness period. Alternative 1: influenza-associated illness period does not exclude symptoms if fever recurs ≥ 3 days after fever alleviation. Alternative 2: influenza-associated illness period only considers symptoms of influenza-like illness. Alternative 3: all symptoms of acute respiratory illness during follow-up contribute to influenza-associated illness period. Displaying acceleration factor for diversity measure.

Shannon Diversity

Model	Original definition	Alternative 1 Shannon	Alternative 2 Shannon	Alternative 3 Shannon
Fever	0.80 (0.31, 2.07)	0.59 (0.20, 1.76)	0.82 (0.32, 2.12)	0.52 (0.18, 1.52)
Runny nose	1.87 (0.67, 5.24)	1.87 (0.67, 5.24)	1.35 (0.64, 2.83)	1.44 (0.67, 3.09)
Sore throat	1.01 (0.55, 1.85)	1.01 (0.55, 1.85)	1.01 (0.55, 1.85)	1.00 (0.55, 1.83)
Cough	1.39 (0.56, 3.49)	1.39 (0.56, 3.49)	1.24 (0.52, 3.04)	1.30 (0.52, 3.27)
Serial interval	0.72 (0.53, 0.97)	0.72 (0.53, 0.97)	0.88 (0.67, 1.16)	0.92 (0.71, 1.21)

Chao1 Index

Model	Original definition	Alternative 1 Chao1	Alternative 2 Chao1	Alternative 3 Chao1
Fever	1.00 (0.99, 1.01)	0.99 (0.98, 1.01)	0.99 (0.99, 1.01)	0.99 (0.98, 1.01)
Runny nose	1.01 (0.996, 1.03)	1.01 (0.99, 1.03)	1.01 (0.996, 1.02)	1.01 (0.996, 1.02)
Sore throat	1.00 (0.99, 1.01)	1.00 (0.99, 1.01)	1.00 (0.99, 1.01)	1.01 (0.99, 1.02)
Cough	1.00 (0.99, 1.02)	1.00 (0.99, 1.02)	1.00 (0.99, 1.02)	1.00 (0.99, 1.01)
Serial interval	0.99 (0.99, 0.998)	0.99 (0.99, 0.998)	1.00 (0.99, 1.002)	1.00 (0.99, 1.01)