

**Table S1.** Serotype *emm59* GAS strains collected in the United States. Epidemiology data and phylogenetic tree branches relative to Fig. 2 and 3 are shown for each strain. Strains denoted with the same superscript number have identical genomes. Strains denoted with a superscript character underwent follow-up epidemiology investigation. Strains MGAS26475-26541 were analyzed during the first rapid response exercise, and strains MGAS26544-26562 were analyzed during the second iteration. Key to characters:  $\alpha$ , live in or periodically visit the same community;  $\beta$ , live in the same community;  $\gamma$ , overlapping stay in a long-term care facility. Key to states: CA, California; CO, Colorado; MN, Minnesota; NM, New Mexico; OR, Oregon. Key to ethnicity: AS, Asian; B, Black; NA, Native American; Unk, Unknown; W, White.

Strain (MGAS)	Year	State	County	Race	Branch of Phylogenetic
					Tree
26475	2010	CA	A	W	singleton
26476	2011	MN	B	NA	$h^{1,\alpha}$
26477	2011	CO	C	W	singleton
26478	2011	OR	D	AS	a
26479	2011	NM	E	W	a
26480	2011	MN	F	W	e
26481	2011	MN	F	W	f
26482	2011	MN	B	NA	$h^{1,\alpha}$
26483	2011	OR	D	W	a
26484	2011	OR	D	W	$a^2$
26485	2011	MN	G	W	f
26486	2011	MN	B	NA	$h^{1,\alpha}$

26487	2011	MN	H	Unk	c
26488	2011	MN	I	W	e
26489	2011	MN	J	NA	h <sup>1,α</sup>
26490	2011	MN	K	NA	h
26491	2011	MN	B	W	h
26492	2011	MN	I	W	h
26493	2011	MN	B	W	h
26494	2011	MN	B	W	f
26495	2011	MN	K	NA	c
26496	2011	OR	D	W	b
26497	2011	MN	J	AS	f
26498	2011	MN	L	W	singleton
26499	2012	MN	B	W	h
26500	2012	MN	B	W	g <sup>3</sup>
26501	2011	NM	M	NA	d
26502	2012	OR	N	W	a <sup>2</sup>
26503	2012	OR	D	W	a
26504	2012	MN	B	NA	e
26505	2012	MN	O	NA	g
26506	2012	MN	O	B	g
26507	2012	MN	K	NA	f <sup>4,β</sup>
26508	2012	MN	B	NA	g <sup>5</sup>
26509	2012	MN	P	NA	e
26510	2012	MN	Q	NA	g <sup>3</sup>
26511	2012	MN	K	NA	f <sup>4,β</sup>
26512	2012	MN	R	W	h <sup>1</sup>
26513	2012	MN	B	W	g
26514	2012	OR	D	Unk	a

26515	2012	OR	D	W	b
26516	2012	NM	E	NA	a
26517	2012	NM	S	W	e
26519	2012	MN	B	NA	g
26520	2012	MN	T	NA	f
26521	2012	MN	B	NA	e
26522	2012	MN	B	B	h
26523	2012	MN	B	NA	e
26524	2012	MN	K	NA	g
26525	2012	MN	B	W	g <sup>5</sup>
26526	2012	MN	B	W	g
26527	2012	OR	D	W	a
26528	2012	OR	D	Unk	b
26529	2012	MN	B	NA	e
26530	2012	MN	U	W	g
26531	2012	MN	U	W	f
26532	2012	MN	B	Unk	f
26533	2012	MN	B	NA	h
26534	2012	MN	B	NA	h
26535	2012	MN	B	W	h
26536	2012	MN	V	W	f
26537	2012	NM	W	NA	d
26538	2012	CO	X	W	singleton
26539	2010	MN	Y	W	singleton
26540	2011	NM	E	Unk	a
26541	2012	CO	X	W	singleton
26544	2013	MN	B	Unk	e
26545	2013	MN	B	NA	h

26546	2013	MN	B	W	h
26547	2013	MN	U	W	e
26548	2013	MN	Z	Unk	e
26549	2013	MN	B	W	g
26550	2013	MN	B	B	h
26551	2013	MN	B	NA	h
26552	2013	MN	B	W	h
26553	2013	MN	B	W	h
26554	2013	MN	B	W	f
26555	2013	MN	AA	W	h
26556	2013	MN	U	W	e <sup>y</sup>
26557	2013	MN	U	W	e <sup>y</sup>
26558	2013	MN	U	W	e
26559	2013	MN	U	W	singleton
26560	2013	MN	G	NA	e
26562	2013	MN	B	NA	e