Supplementary Tables and Figures

S1 Table 1. Serotype Coverage by Vaccine

Serotype	4	6B	9V	14	18C	19F	23F	1	5	7F	3	6A	19A
PCV7	Cross-reacting material 197												
PCV10	Protein D				TT	DT		Protein D					
PCV13	Cross-reacting material 197												

DT = conjugated to diphtheria toxoid; PCV7 = 7-valent pneumococcal conjugate vaccine; PCV10 = 10-valent pneumococcal conjugate vaccine; PCV13 = 13-valent pneumococcal conjugate vaccine; TT = conjugated to tetanus toxoid.

S1 Table 2. Canada-specific Trend Lines by Serotype, Ages < 2 and 2-4

Serotype	Formula Assumption	Noncovered Period	R^2	Formula Assumption	Covered Period	R^2
1	Linear	y = –0.023*x + 0.190	0.1688	–	–	–
3	Linear	y = 0.185*x + –0.190	0.3776	Logarithmic	y = (–0.262*LN(x))+1.298	0.0910
4	Linear	y = 0.045*x + 0.471	0.0166	Exponential	0.000*e^(–2.150x)	0.2722
5	–	–	–	–	–	–
6A	Linear	y = –0.187*x + 1.975	0.4830	–	–	–
6B	Linear	y = –0.373*x + 6.952	0.1560	Logarithmic	y = (–1.037*LN(x))+2.124	0.8248
7F	Linear	y = 0.191*x + –0.351	0.4461	Linear	y = –0.050*x + 0.251	0.1250

Serotype	Assumption	Formula Noncovered Period	R^2	Assumption	Formula Covered Period	R^2
9V	Linear	y = −0.788*x + 3.250	0.9744	Logarithmic	y = (−0.254*LN(x))+0.533	0.7347
14	Linear	y = −4.034*x + 18.334	0.9990	Logarithmic	y = (−0.317*LN(x))+0.635	0.5815
18C	Linear	y = 0.552*x + 1.405	0.6002	Logarithmic	y = (−0.570*LN(x))+1.213	0.7416
19A	Linear	y = 0.946*x + −1.487	0.8245	Linear	y = −1.259*x + 7.461	0.7907
19F	Linear	y = −0.376*x + 5.349	0.1343	Exponential	241.004*e^(−4.062x)	0.5610
23F	Linear	y = −0.513*x + 3.260	0.6696	Linear	y = −0.044*x + 0.483	0.1052
NVT	Linear	y = 0.460*x + 1.230	0.6519			

NVT = nonvaccine type.

Note: "−" denotes that no cases of disease were observed due to this serotype in this age group during the period of interest. As such, no trend lines were applied.

S1 Table 3. Canada-specific Trend Lines by Serotype, Ages 5-17

Serotype	Assumption	Formula Noncovered Period	R^2	Assumption	Formula Covered Period	R^2
1	−	−	−	−	−	−
3	Logarithmic	y = (0.022*LN(x))+0.036	0.0317	Logarithmic	y = (0.021*LN(x))+0.029	0.0154
4	Linear	y = 0.018*x + 0.087	0.0668	Linear	y = −0.006*x + 0.052	0.1600
5	−	−	−	−	−	−
6A	Logarithmic	y = (0.035*LN(x))+−0.001	0.0933	−	−	−
6B	Logarithmic	y = (−0.200*LN(x))+0.290	0.5276	Power	y = 0.003*x^(−10.611)	0.2283
7F	Linear	y = 0.065*x + −0.161	0.5008	Logarithmic	y = (−0.138*LN(x))+0.205	0.7720

9V	Linear	y = –0.048*x + 0.340	0.1359	Exponential	0.000*e^(–2.684x)	0.3373
14	Logarithmic	y = (–0.680*LN(x))+1.147	0.8997	Power	y = 14.267*x^(–17.696)	0.7249
18C	Linear	y = –0.118*x + 0.512	0.8906	Power	y = 0.000*x^(–10.824)	0.3542
19A	Linear	y = 0.062*x + –0.149	0.3295	Logarithmic	y = (–0.163*LN(x))+0.787	0.0688
19F	Logarithmic	y = (0.002*LN(x))+0.171	0.0328	Power	y = 0.002*x^(–12.192)	0.3519
23F	Linear	y = 0.102*x + 0.003	0.6289	Linear	y = –0.015*x + 0.154	0.1631
NVT	Linear	y = 0.077*x + 0.272	0.5086			

NVT = nonvaccine type.

Note: "–" denotes that no cases of disease were observed due to this serotype in this age group during the period of interest. As such, no trend lines were applied.

S1 Table 4. Canada-specific Trend Lines by Serotype, Ages 18-34

Serotype	Formula Assumption	Noncovered Period	R^2	Formula Assumption	Covered Period	R^2
1	Logarithmic	y = (0.017*LN(x))+–0.004	0.0987	–	–	–
3	Logarithmic	y = (0.017*LN(x))+0.172	0.0297	Logarithmic	y = (0.100*LN(x))+0.152	0.3212
4	Logarithmic	y = (–0.086*LN(x))+0.668	0.2438	Logarithmic	y = (–0.187*LN(x))+0.511	0.6690
5	–	–	–	–	–	–
6A	Logarithmic	y = (–0.010*LN(x))+0.085	0.0314	Logarithmic	y = (–0.098*LN(x))+0.127	0.7094
6B	Logarithmic	y = (–0.402*LN(x))+0.595	0.9252	Power	y = 0.138*x^(–13.036)	0.3508
7F	Linear	y = 0.057*x + 0.055	0.4973	Exponential	0.424*e^(–0.213x)	0.7686

Serotype	Assumption	Noncovered Period	R^2	Assumption	Covered Period	R^2
9V	Logarithmic	y = (−0.055*LN(x))+0.302	0.5104	Linear	y = −0.039*x + 0.416	0.7574
14	Linear	y = −0.051*x + 0.630	0.5665	Logarithmic	y = (−0.148*LN(x))+0.334	0.7952
18C	Logarithmic	y = (0.059*LN(x))+0.137	0.2771	Power	y = 106.890*x^(−17.277)	0.6265
19A	Linear	y = 0.059*x + −0.129	0.8689	Exponential	0.523*e^(−0.056x)	0.1202
19F	Logarithmic	y = (0.057*LN(x))+0.081	0.4872	Exponential	0.000*e^(−0.578x)	0.0162
23F	Linear	y = −0.079*x + 0.400	0.8650	Power	y = 709.958*x^(−18.464)	0.7149
NVT	Logarithmic	y = (0.127*LN(x))+1.080	0.0710			

NVT = nonvaccine type.

Note: "–" denotes that no cases of disease were observed due to this serotype in this age group during the period of interest. As such, no trend lines were applied.

S1 Table 5. Canada-specific Trend Lines by Serotype, Ages 35-49

Serotype	Formula Assumption	Noncovered Period	R^2	Formula Assumption	Covered Period	R^2
1	Logarithmic	y = (0.017*LN(x))+−0.004	0.0987	–	–	–
3	Logarithmic	y = (0.017*LN(x))+0.172	0.0297	Logarithmic	y = (0.100*LN(x))+0.152	0.3212
4	Logarithmic	y = (−0.086*LN(x))+0.668	0.2438	Logarithmic	y = (−0.187*LN(x))+0.511	0.6690
5	–	–	–	–	–	–
6A	Logarithmic	y = (−0.010*LN(x))+0.085	0.0314	Logarithmic	y = (−0.098*LN(x))+0.127	0.7094
6B	Logarithmic	y = (−0.402*LN(x))+0.595	0.9252	Power	y = 0.138*x^(−13.036)	0.3508
7F	Linear	y = 0.057*x + 0.055	0.4973	Exponential	0.424*e^(−0.213x)	0.7686

Serotype	Assumption	Noncovered Period	R²	Assumption	Covered Period	R²
9V	Logarithmic	y = (−0.055*LN(x))+0.302	0.5104	Linear	y = −0.039*x + 0.416	0.7574
14	Linear	y = −0.051*x + 0.630	0.5665	Logarithmic	y = (−0.148*LN(x))+0.334	0.7952
18C	Logarithmic	y = (0.059*LN(x))+0.137	0.2771	Power	y = 106.890*x^(−17.277)	0.6265
19A	Linear	y = 0.059*x + −0.129	0.8689	Exponential	0.523*e^(−0.056x)	0.1202
19F	Logarithmic	y = (0.057*LN(x))+0.081	0.4872	Exponential	0.000*e^(−0.578x)	0.0162
23F	Linear	y = −0.079*x + 0.400	0.8650	Power	y = 709.958*x^(−18.464)	0.7149
NVT	Logarithmic	y = (0.127*LN(x))+1.080	0.0710			

NVT = non-vaccine type.

Note: "–" denotes that no cases of disease were observed due to this serotype in this age group during the period of interest. As such, no trend lines were applied.

S1 Table 6. Canada-specific Trend Lines by Serotype, Ages 50-64

Serotype	Formula Assumption	Noncovered Period	R²	Formula Assumption	Covered Period	R²
1	Logarithmic	y = (0.033*LN(x))+−0.001	0.0236	Logarithmic	y = (0.013*LN(x))+0.017	0.0154
3	Linear	y = −0.024*x + 1.050	0.0840	Logarithmic	y = (0.426*LN(x))+0.402	0.7942
4	Logarithmic	y = (−0.970*LN(x))+1.796	0.7208	Logarithmic	y = (−0.490*LN(x))+1.266	0.7231
5	–	–	–	–	–	–
6A	Linear	y = −0.010*x + 0.358	0.0091	Exponential	1,727,972.191*e^(−9.778x)	0.7493
6B	Logarithmic	y = (0.470*LN(x))+0.342	0.2936	Linear	y = −0.018*x + 0.211	0.3069
7F	Linear	y = 0.165*x + −0.234	0.5961	Logarithmic	y = (−0.828*LN(x))+1.391	0.8003

Serotype	Assumption	Noncovered Period	R^2	Assumption	Covered Period	R^2
9V	Linear	y = −0.137*x + 0.985	0.5113	Linear	y = −0.067*x + 0.703	0.4880
14	Logarithmic	y = (−0.836*LN(x))+2.185	0.5388	Exponential	380.993*e^(−2.743x)	0.3474
18C	Logarithmic	y = (−0.540*LN(x))+0.943	0.8514	Exponential	0.000*e^(−1.183x)	0.0511
19A	Linear	y = 0.216*x + −0.202	0.7169	Exponential	1.639*e^(−0.139x)	0.4433
19F	Logarithmic	y = (0.162*LN(x))+0.589	0.0523	Logarithmic	y = (−0.308*LN(x))+0.694	0.8303
23F	Linear	y = −0.241*x + 1.247	0.6542	Linear	y = −0.020*x + 0.205	0.6181
NVT	Linear	y = 0.143*x + 3.337	0.2755			

NVT = nonvaccine type.

Note: "–" denotes that no cases of disease were observed due to this serotype in this age group during the period of interest. As such, no trend lines were applied.

S1 Table 7. Canada-specific Trend Lines by Serotype, Ages 65+

Serotype	Formula Assumption	Noncovered Period	R^2	Formula Assumption	Covered Period	R^2
1	Linear	y = 0.014*x + −0.063	0.3000	Linear	y = −0.025*x + 0.124	0.1250
3	Logarithmic	y = (0.323*LN(x))+3.035	0.0642	Exponential	3.737*e^(−0.175x)	0.4650
4	Logarithmic	y = (−0.758*LN(x))+1.636	0.7017	Linear	y = −0.122*x + 1.191	0.4469
5	–	–	–	–	–	–
6A	Logarithmic	y = (0.262*LN(x))+0.742	0.0933	Linear	y = 0.020*x + 0.339	0.0335
6B	Logarithmic	y = (−0.712*LN(x))+3.375	0.2058	Logarithmic	y = (−1.000*LN(x))+2.446	0.9351
7F	Linear	y = 0.196*x + −0.044	0.6585	Exponential	1.855*e^(−0.302x)	0.2049

|						
9V	Logarithmic	y = (0.288*LN(x))+1.144	0.0786	Linear	y = –0.114*x + 1.149	0.6509
14	Linear	y = –1.563*x + 9.245	0.9459	Exponential	1.729*e^(–0.155x)	0.5228
18C	Linear	y = –0.338*x + 1.639	0.9825	Logarithmic	y = (–0.347*LN(x))+0.779	0.6948
19A	Linear	y = 0.438*x + –0.710	0.8618	Exponential	7.309*e^(–0.313x)	0.9141
19F	Linear	y = –0.310*x + 2.944	0.9294	Linear	y = –0.075*x + 1.051	0.3157
23F	Linear	y = –0.392*x + 3.153	0.1128	Logarithmic	y = (–0.127*LN(x))+0.622	0.1721
NVT	Logarithmic	y = (1.931*LN(x))+7.865	0.6261			

NVT = nonvaccine type.

Note: "–" denotes that no cases of disease were observed due to this serotype in this age group during the period of interest. As such, no trend lines were applied.

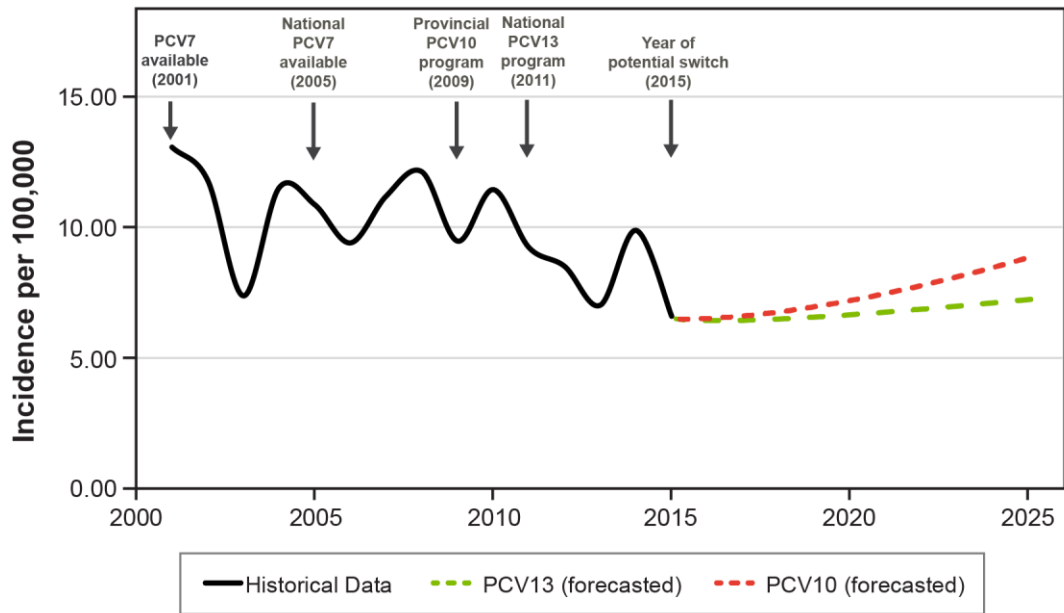**S1 Fig 1. Forecasted IPD Incidence for Persons by Age Groups.**

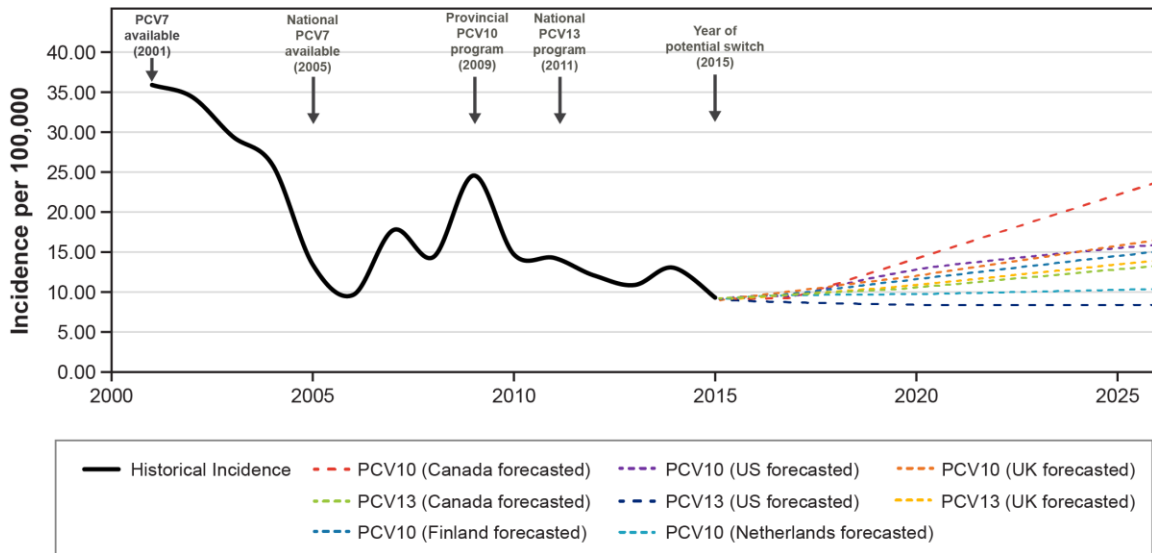**S1 Fig 1a. Forecasted Incidences for Persons 5-17 Years of Age.**
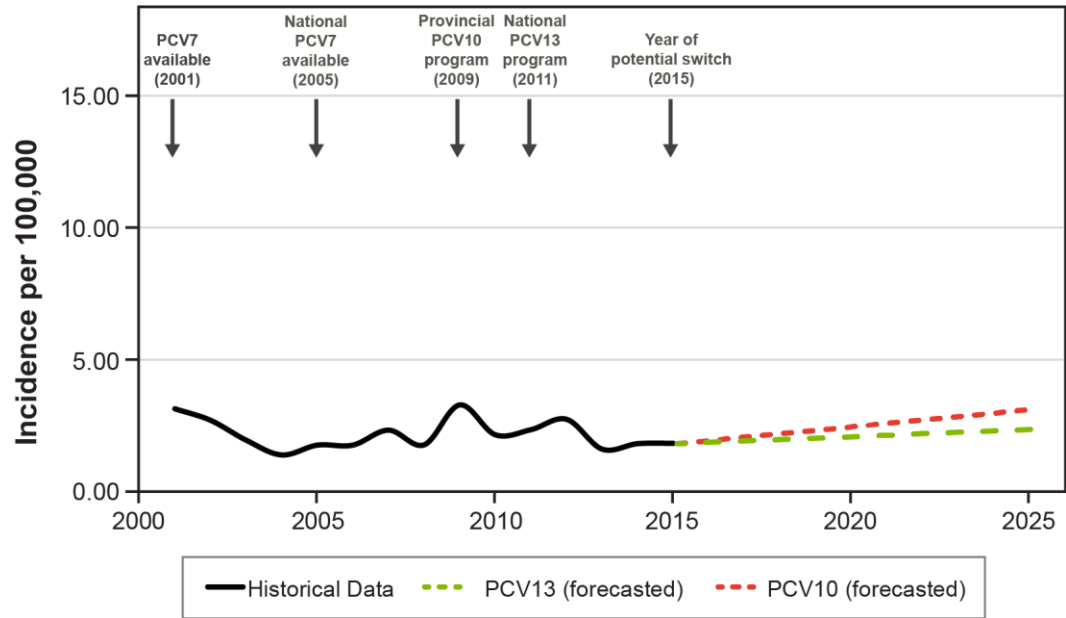
S1 Fig 1b. Forecasted Incidences for Persons 18-49 Years of Age.
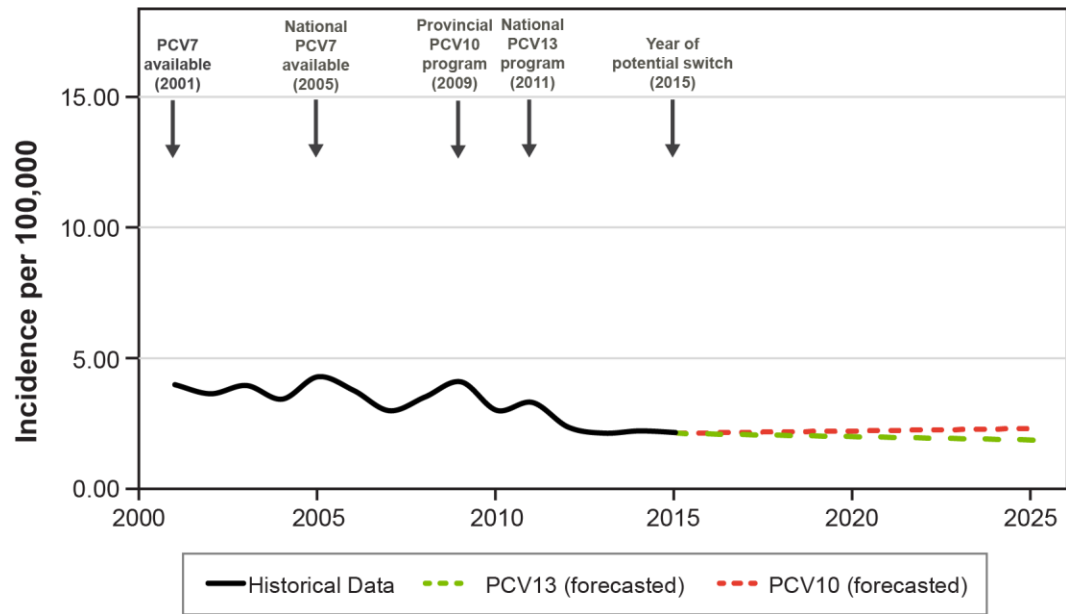
S1 Fig 1c. Forecasted Incidences for Persons 50-64 Years of Age.

S1 Fig 2. Scenario Analysis Trends for Persons 0-2 Years of Age.

S1 Fig 3. Scenario Analysis Trends for Persons ≥ 65 Years of Age.