

Adult Immunisation with Tetanus, Diphtheria, and Pertussis Vaccine for At-Risk Populations (Asthma, COPD, HIV) for the Prevention of Pertussis in Colombia

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Conclusions



Introducing Tdap vaccination for 20-year-old adults with asthma, COPD, or HIV in Colombia at just 10% coverage could substantially decrease pertussis disease burden and associated HCRU



A proportion of the healthcare insurance plan budget would be required to protect those at risk

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Background

- Pertussis (i.e. whooping cough) infection in at-risk adults with pre-existing conditions, is associated with high rates of hospitalisation and increased healthcare resource utilisation (HCRU)^{1–3}
- While children and adolescents are typically vaccinated against pertussis, immunity wanes over time⁴
- Tetanus, diphtheria, and pertussis (Tdap) booster vaccination has been shown to be an effective and safe method to prevent pertussis in at-risk populations, including those with asthma, chronic obstructive pulmonary disease (COPD) and human immunodeficiency virus (HIV), but is currently only recommended for those with HIV in Colombia⁵

Aims



To estimate the 5-year budgetary impact, from the payer's perspective, of introducing Tdap booster vaccination for at-risk adults with asthma, COPD and HIV into Colombia's healthcare insurance plan

Methods

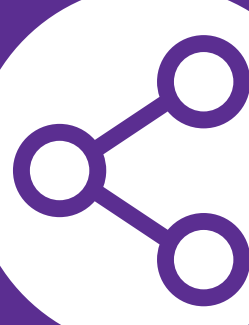
A Microsoft Excel-based model was developed to estimate the budgetary impact over 5 years (2025–2029) of administering 1 dose of Tdap booster to 20-year-old adults with asthma, COPD or HIV in Colombia. Costs are expressed in 2023 United States Dollar (USD \$)



In the base case, the model assumed a 10% vaccination coverage⁶ with a 74% Tdap market share



Age distribution was taken from population pyramids reported by the United Nations Department of Economic and Social Affairs in 2021,⁷ and annual population growth was obtained from the World Bank Group⁸



Pertussis incidence was based on those reported in Brazil between 2011 and 2012.⁹ Asthma, COPD and HIV prevalence data were based on cross sectional studies in Colombia^{10–12}



Costs associated with treating underlying conditions were sourced from three cost-of-illness studies of each disease in Colombia^{13–15}



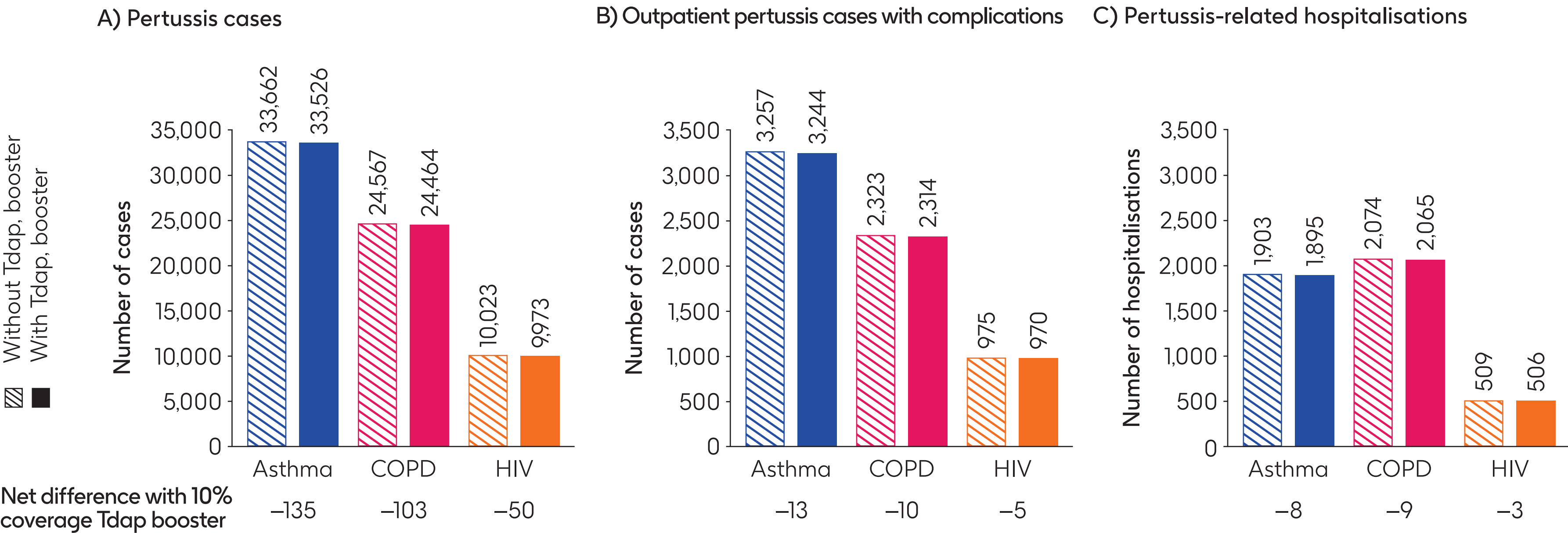
Vaccine-related and pertussis-related disease management costs were calculated based on 2023 pricing data from the Colombian health system database, SISPRO^{16–17}

A scenario analysis is also presented where the market share of Tdap was increased to 100%

Results

Pertussis cases, outpatient complications and hospitalisations

Figure 1: Pertussis-related health outcomes with and without Tdap entry as a booster



- Assuming just 10% coverage, introducing Tdap for patients with asthma, COPD and HIV could avert 135, 103 and 50 pertussis cases, 13, 10 and 5 outpatient pertussis cases with complications and 8, 9 and 3 pertussis-related hospitalisations over 5 years, respectively (Figure 1)
- Without Tdap, there would be an estimated 12, 9 and 3 pertussis-related deaths for asthma, COPD and HIV, respectively. With Tdap, no deaths were predicted to be avoided

Cost and budget impact

- Over 5 years, with 10% Tdap immunisation coverage (Figure 2, Table 1)
 - Estimated immunisation costs were \$1.5 M for asthma (99 K doses), \$1.5 M for COPD (102 K doses) and \$291 K for HIV patients (20 K doses)
 - Estimated savings in pertussis disease management costs were \$142 K for asthma, \$165 K for COPD and \$46.3 K for HIV
 - Estimated savings in costs for treatment of exacerbations of underlying conditions were \$7.7 K for asthma, \$80.8 K for COPD and \$107 K for HIV
- The total budget impact of introducing Tdap over 5 years was predicted to be \$1.3 M, \$1.2 M and \$0.1 M for these conditions (Figure 2, Table 1)

Figure 2: Total budget impact of Tdap entry as a booster into Colombia's healthcare insurance plans

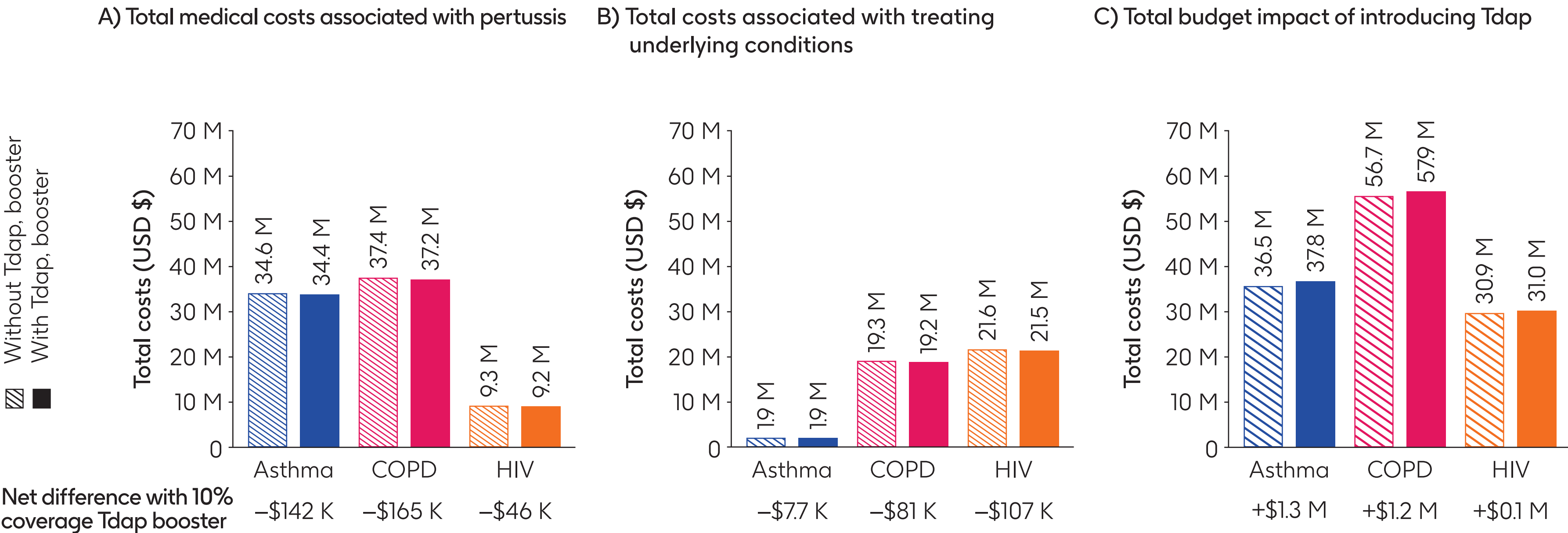


Table 1: Total budget impact of Tdap entry as a booster into Colombia's healthcare insurance plans, by year

Incremental cost, USD ^a					
	Year	Vaccination	Pertussis disease management	Treatment of underlying conditions	Total budget impact
Asthma	1	284,542.31	-27,753.33	-1,497.29	255,291.70
	2	287,672.28	-28,058.61	-1,513.76	258,099.90
	3	290,836.67	-28,367.26	-1,530.41	260,939.00
	4	294,035.88	-28,679.30	-1,547.25	263,809.33
	5	297,270.27	-28,994.77	-1,564.27	266,711.23
	Total	1,454,357.42	-141,853.27	-7,652.98	1,304,851.17
COPD	1	291,139.16	-32,195.27	-15,817.19	243,126.71
	2	294,341.69	-32,549.41	-15,991.18	245,801.10
	3	297,579.45	-32,907.46	-16,167.08	248,504.91
	4	300,852.83	-33,269.44	-16,344.92	251,238.47
	5	304,162.21	-33,635.40	-16,524.71	254,002.09
	Total	1,488,075.34	-164,556.98	-80,845.08	1,242,673.28
HIV	1	56,885.05	-9,052.39	-20,937.92	26,894.74
	2	57,510.79	-9,151.97	-21,168.24	27,190.58
	3	58,143.41	-9,252.64	-21,401.09	27,489.68
	4	58,782.99	-9,354.42	-21,636.50	27,792.06
	5	59,429.60	-9,457.32	-21,874.50	28,097.77
	Total	290,751.83	-46,268.74	-107,018.26	137,464.83

[a] Incremental cost was calculated by subtracting the cost without Tdap entry from the cost with Tdap entry

Scenario analysis

- The scenario analyses estimated a total budget impact of \$1.8 M, \$1.7 M and \$0.2 M for asthma, COPD and HIV patients respectively (~35% increase)

Abbreviations

COPD, chronic obstructive pulmonary disease; HCRU, healthcare resource utilisation; HIV, human immunodeficiency virus; K, thousand; M, million; Tdap, tetanus, diphtheria, and pertussis vaccine; USD, United States dollar

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Disclosures

NA and JG: employee of, and hold financial equities in GSK; ER and VS: employee of GSK; LT: employee of GSK and shareholder of Sanofi

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