

AN URGENT NEED FOR VVMs

Ruary Thompson | Ryan Hartman | Sorana Nance | Maximilian Powers



Pan American
Health
Organization

AGENDA



FOUNDATIONS OF SUCCESS

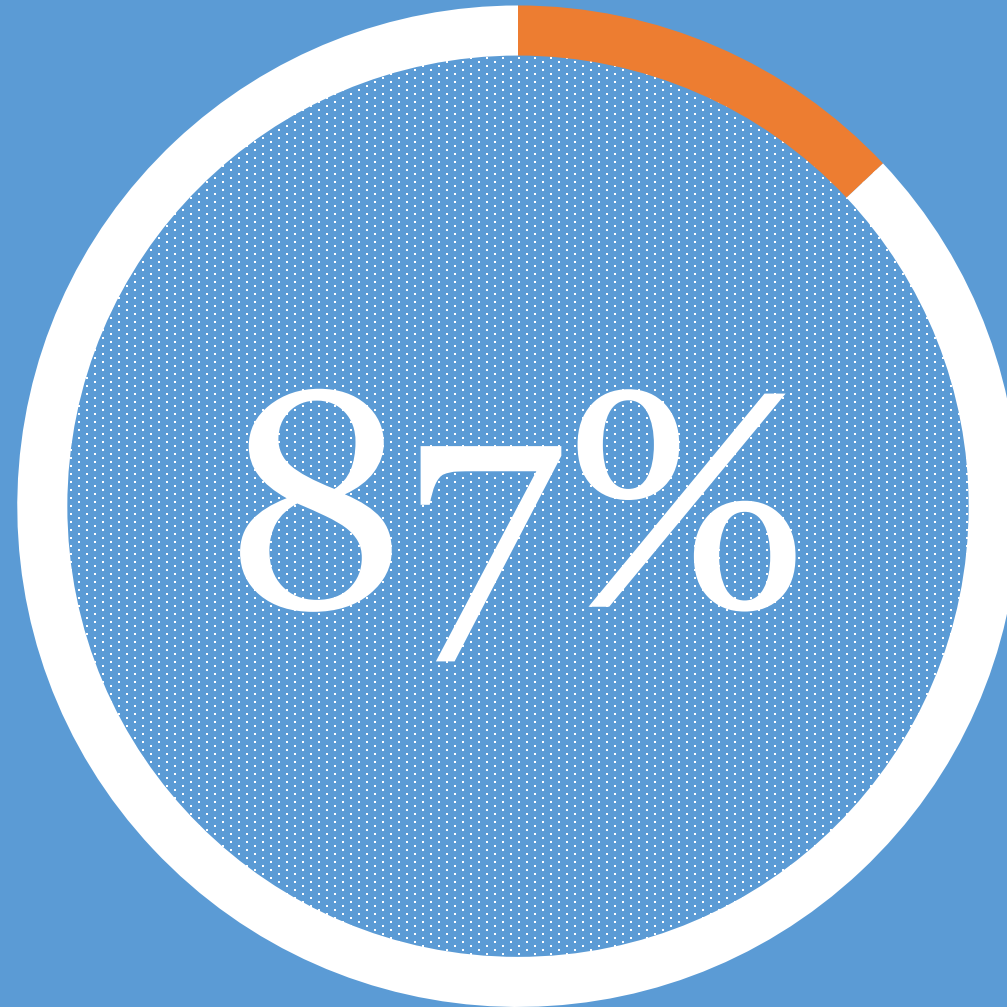
“

***extension of** the reach of national **immunization programs**, new vaccine introductions, **strengthening of regulatory pathways** and **improving financing** and forecasting mechanisms.*

”

-- Developing Countries Vaccine Manufacturers Network

FOUNDATIONS OF SUCCESS



BACKGROUND

SOLUTION

FINANCES

ALTERNATIVES

RISKS

A REAL IMPACT



CHANGING LANDSCAPES



'Welcome to peace': Colombia's Farc rebels seal historic disarmament

- Revolutionary group hands in 7,000 weapons as part of historic peace deal
- 'Today doesn't end the existence of the Farc; it ends our armed struggle'

BACKGROUND

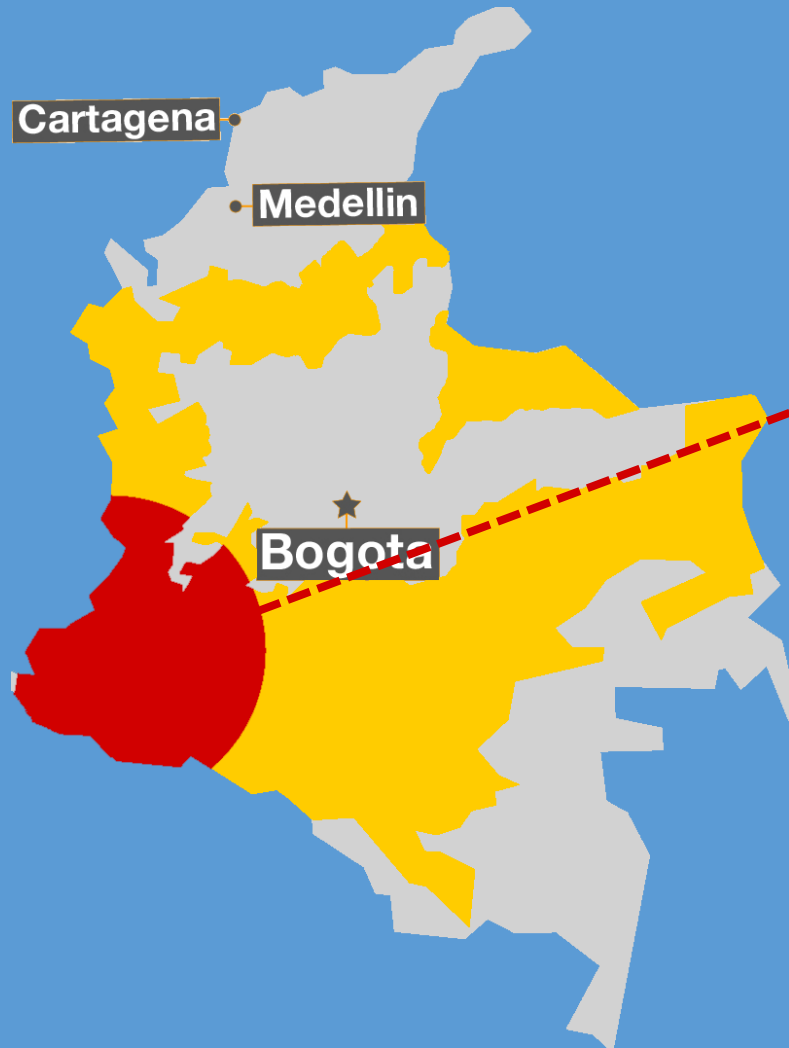
SOLUTION

FINANCES

ALTERNATIVES

RISKS

CHANGING LANDSCAPES



Dense Population

- Access
- Demand
- Infrastructure

BACKGROUND

SOLUTION

FINANCES

ALTERNATIVES

RISKS

CHANGING LANDSCAPES



CHANGING LANDSCAPES



2,500+

“

*Every day we are seeing up to **25,000** people cross the border, and approximately 10% get their **passports stamped** and head into the centre of the country*

”

-- Joe Daniels, in The Guardian

BACKGROUND

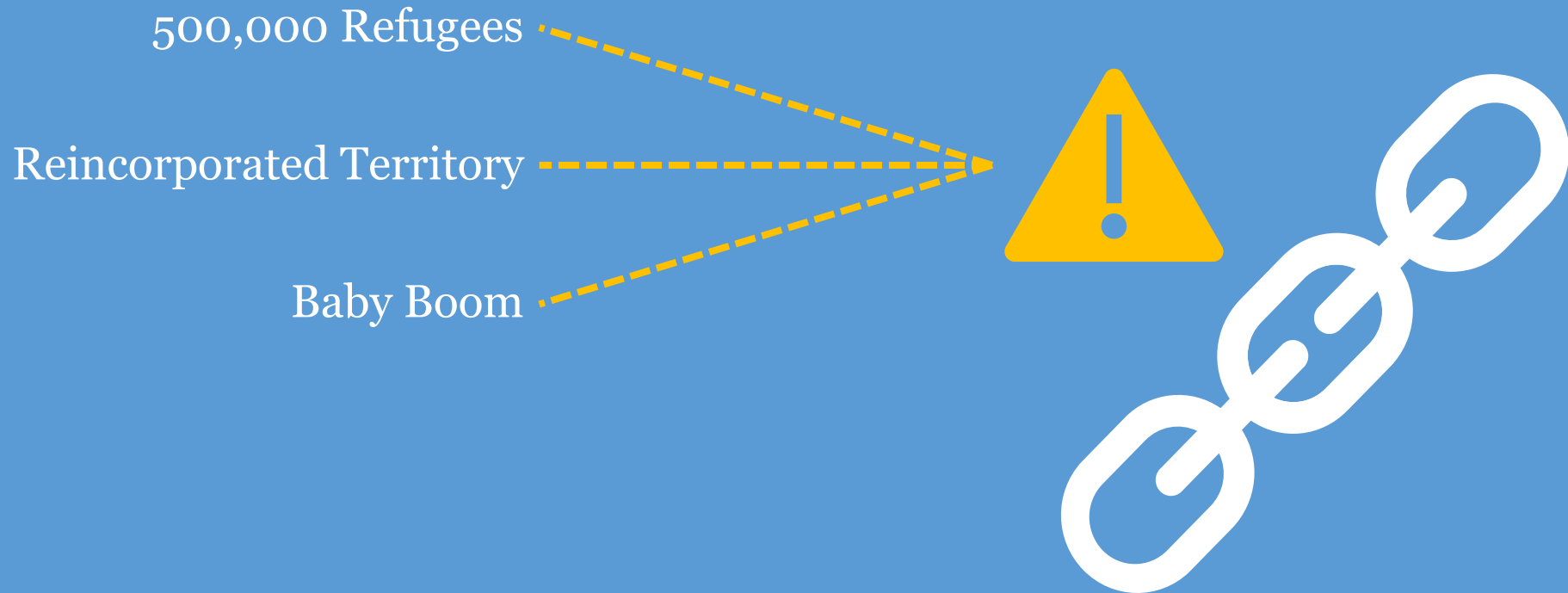
SOLUTION

FINANCES

ALTERNATIVES

RISKS

COLD CHAIN UNCERTAINTY



SOLUTION

Mandate VVM use



Partnership



Phase-in



Training

BACKGROUND

SOLUTION

FINANCES

ALTERNATIVES

RISKS

PARTNERSHIP



BACKGROUND

SOLUTION

FINANCES

ALTERNATIVES

RISKS

PHASE-IN



+



MANDATE

VVMs in border cities and new FARC territory

EXHAUST

Existing supply of VVMs in stable regions

INTRODUCE

VVMs everywhere after existing supplies run out

BACKGROUND

SOLUTION

FINANCES

ALTERNATIVES

RISKS

TRAINING

“

***PATH** and **WHO** have also developed and tested training materials for health workers that help them learn how to handle vaccines and use **VVMs** effectively.*

”

-- Official Statement, PATH.org



VVM COSTS

<u>Year</u>	<u># Doses</u>	<u>Total VVM Cost</u>
Year 1	7660387	392211.81
Year 2	7660387	392211.81
Year 3	5910387	302611.81
Year 4+	4160387	213011.81

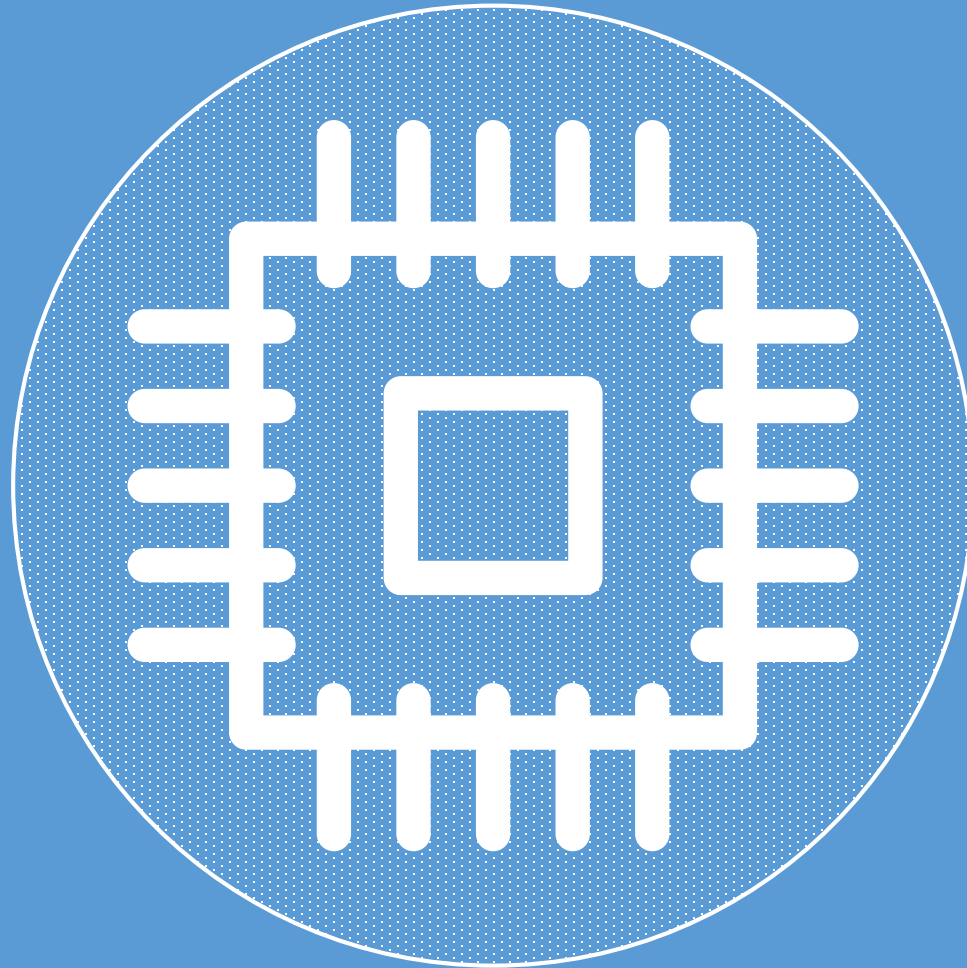
TRAINING COSTS

<u>Year</u>	<u>Fixed Training Inv</u>	<u>Training Wages</u>	<u>Total Training</u>
Year 1	55500	19500	75000
Year 2	0	19500	19500
Year 3	0	19500	19500
Year 4+	0	19500	19500

FINANCING

<u>Year</u>	<u>Total Cost</u>	<u>Covered by PAHO</u>	<u>Covered by Government</u>
Year 1	467211.81	447601.22	19610.59
Year 2	411711.81	392101.22	19610.59
Year 3	322111.81	306981.22	15130.59
Year 4+	232511.81	221861.22	10650.59

ELECTRONIC ALTERNATIVES



BACKGROUND

SOLUTION

FINANCES

ALTERNATIVES

RISKS

EXPANDING COLD CHAIN



BACKGROUND

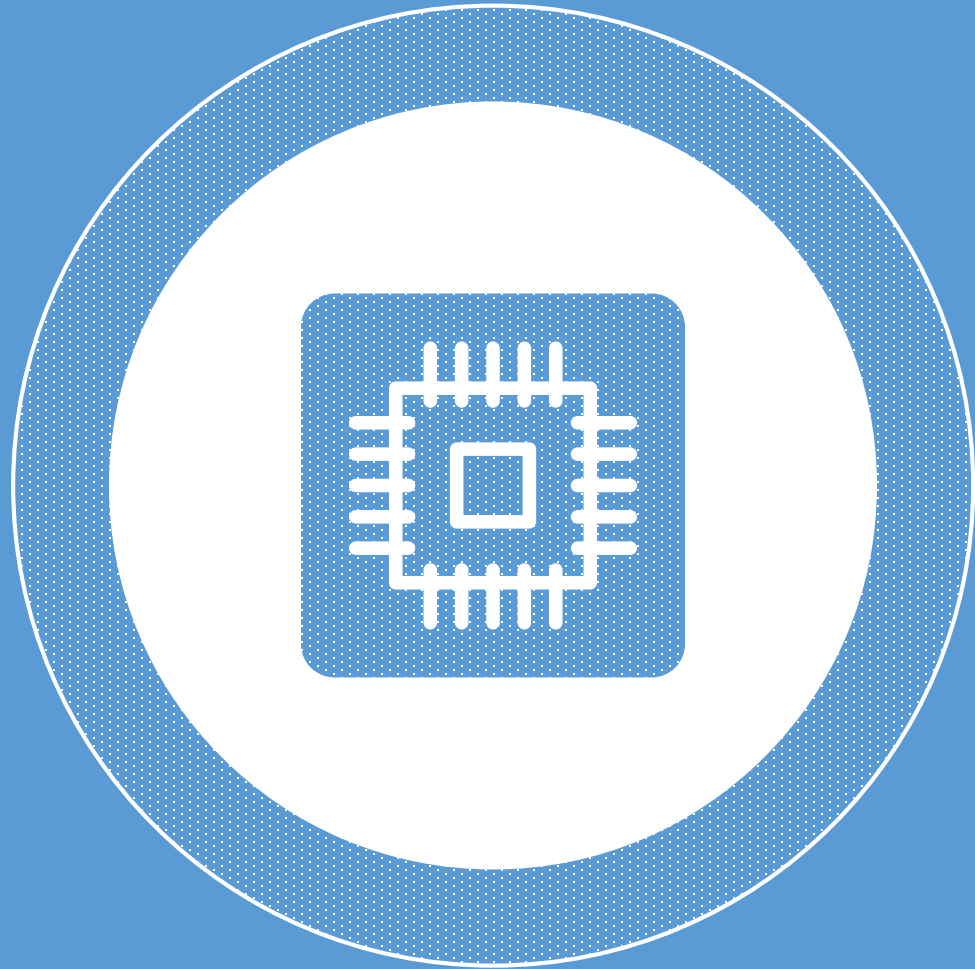
SOLUTION

FINANCES

ALTERNATIVES

RISKS

TECHNOLOGY CHANGE



BACKGROUND

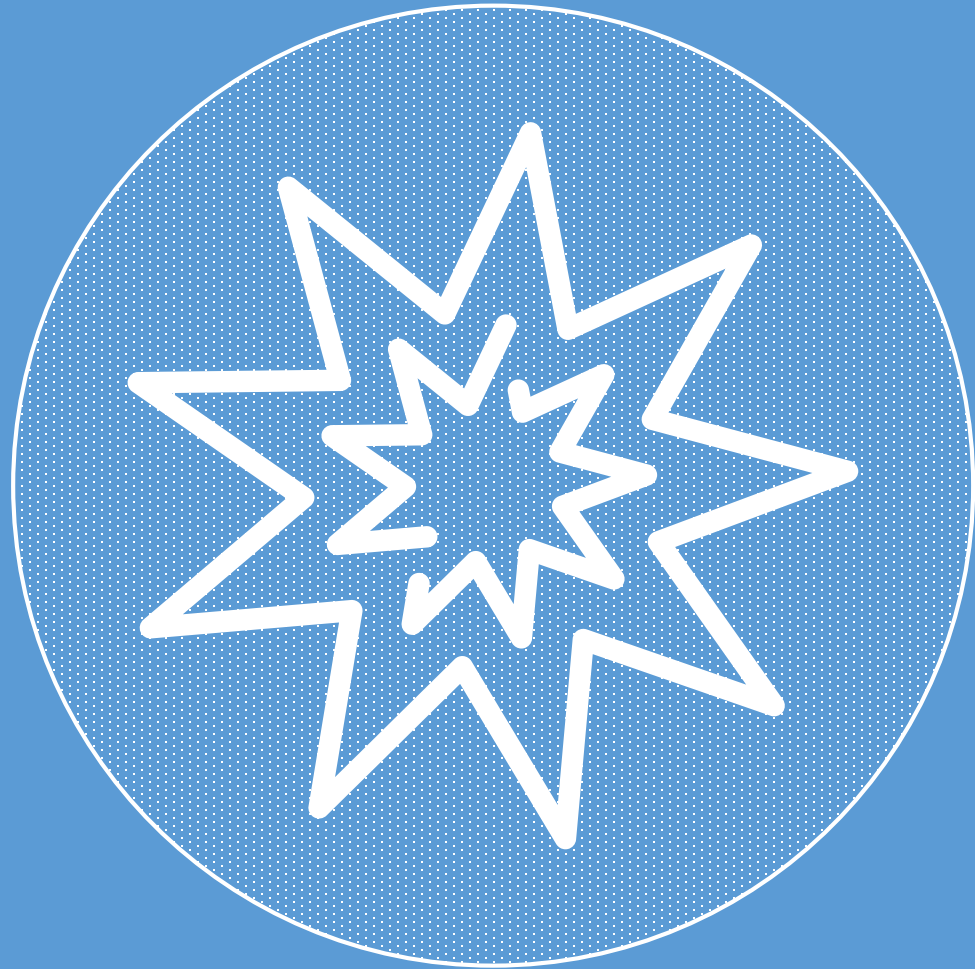
SOLUTION

FINANCES

ALTERNATIVES

RISKS

PEACE DISRUPTION



BACKGROUND

SOLUTION

FINANCES

ALTERNATIVES

RISKS

CONCLUSION

Mandate VVM use



Partnership



Phase-in



Training

APPENDIX

Risk Areas - Yellow Fever

**Regional Immunization
Profile**

**FARC+UNICEF
Relationship**

Long-term VVM Necessity

Sustained Peace with FARC

Vaccine Rates in Colombia

Colombia's Budget Increase

4 Finance Projections

Colombia's Budget

BOGOTA, Oct 18 (Reuters) - Colombia's congress approved an \$80 billion budget for 2018 on Wednesday, a 1 percent increase over this year's spending, as the government seeks to retain the country's 'BBB' credit rating.

Sustained Peace with FARC

Eventually, I think we will see that the peace agreement will benefit everyone, in economic terms and in social terms. There are various sections of Colombian society that are excluded from the benefits of development and economic growth. Peace will aid Colombia's economic development. Colombia is still one of the most under-developed countries in the world, with everything concentrated in the cities.

“

After so much death I had to leave. I was tired of war.

Risk Areas in South America





EXPANDED PROGRAM OF IMMUNIZATION
VACCINE PRICES FOR YEAR 2018

VACCINE	PRESENTATION (Doses)	WEIGHTED AVERAGE PRICE PER DOSE
BCG	10	\$0.2073
Cholera	1	\$1.8500
DPT	10	\$0.1685
DPT Hib Lyophilized	1	\$2.6500
DPT Hep B Hib (Pentavalent) Liquid	1	\$1.0830
DT (Adulto)	10	\$0.0935
DT (Pediatric)	10	\$0.1670
DTaP Triple Acellular Adolescent/Adult	1	\$11.4653
DTaP Triple Acellular Pediatric	1	\$15.0000
DTaP-IPV (Tetravalent Acellular)	1	\$11.5000
DTaP-IPV-Hib (Pentavalent Acellular) Prefilled Syringe	1	\$14.2000
DTaP-IPV-Hep B-Hib (Hexavalent Acellular)	1	\$20.6000
Hepatitis "A" Adult	1	\$13.2000
Hepatitis "A" Pediatric	1	\$8.1150
Hepatitis B Recombinant Adult	1	\$0.3264
Hepatitis B Recombinant Adult	10	\$0.1815
Hepatitis B Recombinant Pediatric	1	\$0.2165
HIB Lyophilized	1	\$2.0500
Meningococcal ACYW135	1	\$20.3000
Human Papiloma Virus (HPV) Bivalent	1	\$8.5000
Human Papiloma Virus	1	\$9.5800
Inactivated Polio (IPV)	1	\$5.3000
Inactivated Polio (IPV)	5	\$2.0000
Measles-Rubella	1	\$2.2500
Measles-Rubella	10	\$0.6160
Measles/Mumps(Jeryl-Lynn)/Rubella	1	\$5.5900
Measles/Mumps(Zagreb)/Rubella	1	\$2.7500
Measles/Mumps(Zagreb)/Rubella	5	\$1.4300
Oral Polio Bivalent (bOPV)	10	\$0.1700
Oral Polio Bivalent (bOPV)	20	\$0.1292
Pneumococcal Unconjugated Adult - 23 valent	1	\$7.9800
Rabies Canine - France Origin	10	\$0.2950
Rabies Canine - Uruguay Origin	10	\$0.2750
Rabies Canine - Argentina Origin	20 or 25	\$0.2500
Rabies Vaccine Human Use / Vero Cells	1	\$12.8000
Typhoid Polysaccharide	20	\$9.0000
Varicella	1	\$14.4590
Yellow Fever	5	\$1.2800
Yellow Fever	10	\$1.4300

Regional Immunization Profile

Percentage of target population vaccinated, by antigen								
<i>based on WHO-UNICEF estimates</i>								
<i>TT2plus is based on reported coverage</i>								
BCG	88	88	89	89	90	80	81	15
DTP1	91	90	91	90	90	83	88	31
DTP3	86	85	85	85	85	72	75	21
HepB_BD	39	38	37	37	34	6	-	-
HepB3	84	83	82	80	80	29	1	-
Hib3	70	63	55	51	44	14	0	-
IPV1	46	22	-	-	-	-	-	-
MCV1	85	85	84	84	84	72	73	17
MCV2	64	60	56	54	49	15	-	-
PCV3	42	37	32	26	19	-	-	-
Pol3	85	85	85	85	85	73	75	22
RCV1	47	47	44	42	40	21	8	3
RotaC	25	23	19	14	11	-	-	-
TT2plus	72	69	67	66	75	62	55	9
YFV	45	45	45	41	37	12	-	-

Colombian Vaccination Rates

	BCG	DTP1	DTP3	DTP4	DTP4	HepB_BC	HepB3	Hib3	MCV1	MCV2	PCV1
Colombia	97	77	67	91	86	87	82	81	88	94	81

Scenario One

<u>MAX ESTIMATE (100% COVERAGE)</u>						
<u>YEAR</u>	<u>EXTRA BIRTHS</u>	<u>EXTRA REFUGEES</u>	<u>TOTAL POP INC</u>	<u>100% COVERAGE</u>	<u>FOR ALL VACCINES</u>	<u>5.12 CENTS PER DOSE</u>
YEAR 1	418550	500000	918550	918550	12859700	658416.64
YEAR 2	418550	500000	918550	918550	12859700	658416.64
YEAR 3	418550	250000	668550	668550	9359700	479216.64
YEAR 4+	418550	0	418550	418550	5859700	300016.64
<u>YEAR</u>	<u>VVM COST</u>	<u>TRAINING</u>	<u>COVERED BY PAHO</u>	<u>COVERED BY GOVERNMENT</u>	<u>TOTAL COST</u>	
YEAR 1	658416.64	75000	700495.808	32920.832	733416.64	
YEAR 2	658416.64	19500	644995.808	32920.832	677916.64	
YEAR 3	479216.64	19500	474755.808	23960.832	498716.64	
YEAR 4+	300016.64	19500	304515.808	15000.832	319516.64	

Scenario Two

<u>GREAT ESTIMATE (SQUO COVERAGE)</u>							
<u>YEAR</u>	<u>EXTRA BIRTHS</u>	<u>EXTRA REFUGEES</u>	<u>TOTAL POP INC</u>	<u>87% BIRTH COVERAGE</u>	<u>50% REFUGEE COVERAGE</u>	<u>FOR ALL VACCINES</u>	<u>5.12 CENTS PER DOSE</u>
YEAR 1	418550	500000	918550	364138.5	250000	8597939	440214.4768
YEAR 2	418550	500000	918550	364138.5	250000	8597939	440214.4768
YEAR 3	418550	250000	668550	364138.5	125000	6847939	350614.4768
YEAR 4+	418550	0	418550	364138.5	0	5097939	261014.4768
<u>YEAR</u>	<u>VVM COST</u>	<u>TRAINING</u>	<u>COVERED BY PAHO</u>	<u>COVERED BY GOVERNMENT</u>	<u>TOTAL COST</u>		
YEAR 1	440214.4768	75000	493203.753	22010.72384	515214.4768		
YEAR 2	440214.4768	19500	437703.753	22010.72384	459714.4768		
YEAR 3	350614.4768	19500	352583.753	17530.72384	370114.4768		
YEAR 4+	261014.4768	19500	267463.753	13050.72384	280514.4768		

Scenario Three

REAL ESTIMATE (PROJECTED COVERAGE)							
<u>YEAR</u>	<u>EXTRA BIRTHS</u>	<u>EXTRA REFUGEES</u>	<u>TOTAL POP INC</u>	<u>71% REAL COVERAGE</u>	<u>50% REFUGEE COVERAGE</u>	<u>FOR ALL VACCINES</u>	<u>5.12 CENTS PER DOSE</u>
YEAR 1	418550	500000	918550	297170.5	250000	7660387	392211.8144
YEAR 2	418550	500000	918550	297170.5	250000	7660387	392211.8144
YEAR 3	418550	250000	668550	297170.5	125000	5910387	302611.8144
YEAR 4+	418550	0	418550	297170.5	0	4160387	213011.8144
<u>YEAR</u>	<u>VVM COST</u>	<u>TRAINING</u>	<u>COVERED BY PAHO</u>	<u>COVERED BY GOVERNMENT</u>		<u>TOTAL COST</u>	
YEAR 1	392211.8144	75000	447601.2237	19610.59072		467211.8144	
YEAR 2	392211.8144	19500	392101.2237	19610.59072		411711.8144	
YEAR 3	302611.8144	19500	306981.2237	15130.59072		322111.8144	
YEAR 4+	213011.8144	19500	221861.2237	10650.59072		232511.8144	

Scenario Four

BAD ESTIMATE (POOR COVERAGE)							
<u>YEAR</u>	<u>EXTRA BIRTHS</u>	<u>EXTRA REFUGEES</u>	<u>TOTAL POP INC</u>	<u>58% NEW COVERAGE</u>	<u>25% REFUGEE COVERAGE</u>	<u>FOR ALL VACCINES</u>	<u>5.12 CENTS PER DOSE</u>
YEAR 1	418550	500000	918550	242759	125000	5148626	263609.6512
YEAR 2	418550	500000	918550	242759	125000	5148626	263609.6512
YEAR 3	418550	250000	668550	242759	62500	4273626	218809.6512
YEAR 4+	418550	0	418550	242759	0	3398626	174009.6512
<u>YEAR</u>	<u>VVM COST</u>	<u>TRAINING</u>	<u>COVERED BY PAHO</u>	<u>COVERED BY GOVERNMENT</u>		<u>TOTAL COST</u>	
YEAR 1	263609.6512	75000	325429.1686	13180.48256		338609.6512	
YEAR 2	263609.6512	19500	269929.1686	13180.48256		283109.6512	
YEAR 3	218809.6512	19500	227369.1686	10940.48256		238309.6512	
YEAR 4+	174009.6512	19500	184809.1686	8700.48256		193509.6512	

References

- <https://www.npr.org/sections/parallels/2017/05/03/526690242/after-peace-agreement-a-baby-boom-among-colombias-farc-guerrillas>
- http://www.paho.org/hq/index.php?option=com_content&view=article&id=13239%3Aprovac-main&catid=9272%3Aprovac&Itemid=841&lang=en
- <https://www.sciencedirect.com/science/article/pii/S0264410X17301986>
- http://apps.who.int/iris/bitstream/10665/67806/1/WHO_V-B_02.35_eng.pdf
- <http://polioeradication.org/news-post/vaccine-vial-monitors-helping-save-lives/>
- http://www.who.int/immunization/monitoring_surveillance/data/gloprofile.pdf
- <https://www.usatoday.com/story/news/world/2017/06/22/venezuela-medical-shortages-doctors-health-care/103039928/>
- https://www.cdc.gov/yellowfever/maps/south_america.html
- <https://www.ncbi.nlm.nih.gov/pubmed/11190969>
- <https://www.sciencedirect.com/science/article/pii/S147330991730419X>
- http://www.who.int/immunization/sage/financing_policy_practice.pdf
- <https://www.npr.org/sections/parallels/2017/05/03/526690242/after-peace-agreement-a-baby-boom-among-colombias-farc-guerrillas>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4089932/>
- https://www.path.org/publications/files/TS_opt_vvm_faqs.pdf
- https://www.unicef.org/about/annualreport/files/Colombia_2016_COAR.pdf
- http://www.paho.org/hq/index.php?option=com_content&view=article&id=1864%3A2014-paho-revolving-fund&catid=839%3Arevolving-fund&Itemid=4135&lang=en
- <http://www.aljazeera.com/indepth/features/2017/10/colombia-fragile-peace-year-farc-referendum-171002065629390.html>
- <https://www.cnbc.com/2017/10/18/reuters-america-colombias-congress-approves-80-bln-budget-for-2018.html>
- <http://www.euromonitor.com/colombia-in-2030-the-future-demographic/report>
- <https://www.csmonitor.com/World/Americas/2017/1122/In-post-conflict-Colombia-land-rights-and-funding-for-peacebuilding-face-off>