

A report on  
current global  
access to new  
childhood  
vaccines



# VIEW-hub

## VIEW-hub Report: Global Vaccine Introduction and Implementation

December 2018

Developed from data in VIEW-hub  
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### New vaccine introduction updates (since September 2018) include:

- Haiti has introduced PCV
- Togo has introduced IPV

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## Acknowledgement and Notes

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- The appendix includes a description of VIEW-hub, support and funding for VIEW-hub, and how to cite VIEW-hub as a source.

This report and the PowerPoint slides with the report graphics can be found at: <http://www.jhsph.edu/research/centers-and-institutes/ivac/view-hub>. For all other VIEW-hub-related inquiries, please email Kirthini Muralidharan at [kmurali2@jhu.edu](mailto:kmurali2@jhu.edu).

Any data on projected introduction dates should not be reproduced or disseminated without prior consent from VIEW-hub personnel.

## VACCINE INTRODUCTION DASHBOARD

The following section provides contextual historic information about Hib vaccine, PCV, rotavirus vaccine, and IPV introduction in low-, middle-, and high-income countries, as well as Gavi-supported countries. It also provides a summary snapshot of the cumulative number of countries that have introduced each vaccine to date (globally and for Gavi countries only).

### Year of First Vaccine Introduction

Income Level	Hib Vaccine	PCV	Rotavirus Vaccine	IPV
High-Income	1989 (Iceland)	2000 (US)	2006 (3 countries)	1955 (2 countries)
Middle-Income	1994 (2 countries)	2008 (5 countries)	2006 (5 countries)	1959 (Hungary)
Low-Income	1997 (Gambia)	2009 (Rwanda)	2012 (Rwanda)	2014 (Nepal)
Gavi Supported	2001 (2 countries)	2009 (2 countries)	2008 (Bolivia)	2014 (Nepal)

### Total number of countries that have introduced each vaccine, by program type

Vaccine	Global Introductions (194 Countries)			Total
	Universal	Special Risk Populations*	Subnational	
Hib	190	1	1	192
PCV	136	3	5	144
Rotavirus	91	0	6	97
IPV**	186	0	5	191

Vaccine	Gavi Introductions (73 Countries)			Total
	Universal	Special Risk Populations*	Subnational	
Hib	73	0	0	73
PCV	57	0	3	60
Rotavirus	45	0	1	46
IPV**	67	0	3	70

\*This program type targets special populations at high risk, and will be hereforth referred to as "risk programs". Note: The definition of high-risk populations may vary by country.

\*\*IPV introduction defined as the inclusion of at least one dose of IPV into the child immunization schedule.

## EXECUTIVE SUMMARY

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The VIEW-hub Global Vaccine Introduction and Implementation report is an extension of the previous VIMS report, with enhanced content and figures generated by IVAC's newly launched VIEW-hub data visualization platform, now accessible at [www.VIEW-hub.org](http://www.VIEW-hub.org). VIEW-hub is an interactive platform (supported by internal databases), developed and maintained by IVAC and supported by Gavi, The Vaccine Alliance, the Bill & Melinda Gates Foundation and the ROTA Council.

The VIEW-hub report displays data and figures on the introduction status of *Haemophilus influenzae* type b (Hib) vaccine, pneumococcal conjugate vaccine (PCV), rotavirus vaccine, and inactivated polio vaccine (IPV) both globally and in the 73 Gavi countries. The images and text below describe: the number of countries that have introduced each vaccine or plan to in the future, global and Gavi rates of vaccine coverage and access, projected introduction dates for Gavi countries, historical trends in the rate of global vaccine introduction.

Since March 2016, new additions to the VIEW-hub report are information on countries' current product and dosing schedule for pneumococcal conjugate vaccine (PCV), rotavirus vaccine, and inactivated polio vaccine (IPV). Beginning in June 2016, besides the vaccine introduction dashboard section of the report, Hib updates will be limited to the global map of introductions and pie chart of introductions, given most countries (except 2) have already introduced the vaccine.

The report concludes with a more detailed description of VIEW-hub and its uses.

## METHODS

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This report has been prepared using data and maps generated in VIEW-hub, a data visualization tool developed and maintained by the International Vaccine Access Center at the Johns Hopkins Bloomberg School of Public Health for use by IVAC and its affiliated partners and projects. Information in VIEW-hub was gathered from internationally recognized sources, such as the World Health Organization (WHO), UNICEF, Gavi, vaccine manufacturers, ministries of health, and news media.

### Current Introduction Statuses for Hib, Pneumococcal Conjugate, Rotavirus, and Inactivated Polio Vaccines

- Data on historical years of vaccine introduction are gathered from the WHO. Information on current introduction status are gathered from a variety of sources, such as WHO, UNICEF, Gavi, vaccine manufacturers, ministries of health, and news media. Forecasted introduction dates are from WHO and Gavi's Strategic Demand Forecast v12. For more information on sources, see the full data dictionary within VIEW-hub ([www.VIEW-hub.org](http://www.VIEW-hub.org)) or email Kirthini Muralidharan at [kmurali2@jhu.edu](mailto:kmurali2@jhu.edu).

### Coverage

- The number of children vaccinated in each country, was calculated with the following formula: Surviving Infants with Access\*Vaccine Coverage Rate. (See method for calculating number of surviving infants with access in the "Access" section below.) The following WHO/UNICEF estimates of national immunization coverage (WUENIC) were used for each vaccine: third dose of PCV, last dose of rotavirus vaccine, and first dose of IPV. For countries that have introduced a vaccine, but the coverage rate for that particular vaccine is not yet available, DTP3 coverage rates were used as a proxy to estimate level of coverage.

### Access

- The variable "surviving infants with access" refers to the number of children in each country who are intended to be vaccinated according to the country's vaccine policy. It is therefore a combination of the number of surviving infants in the country and the type of vaccine program (i.e., recommended for use universally in all infants, among special populations at high risk of disease only, or only in subnational areas). If the country has introduced universally, the number of surviving infants with access is equal to the total number of surviving infants in the country. Given the difficulty in estimating the number of surviving infants targeted by countries vaccinating only special risk populations (as the definition for special populations at high risk vary by country), the number of infants with access in these countries is assumed to be the country's total number of surviving infants (although we acknowledge this is an overestimate and a limitation in the analysis). For countries currently with subnational vaccine programs, the number of surviving infants with access is equal to the total number of surviving infants in the country multiplied by the fraction of the total population that are living in the subnational areas that have introduced. For countries that have not yet introduced a vaccine, the number of surviving infants with access is set at zero.

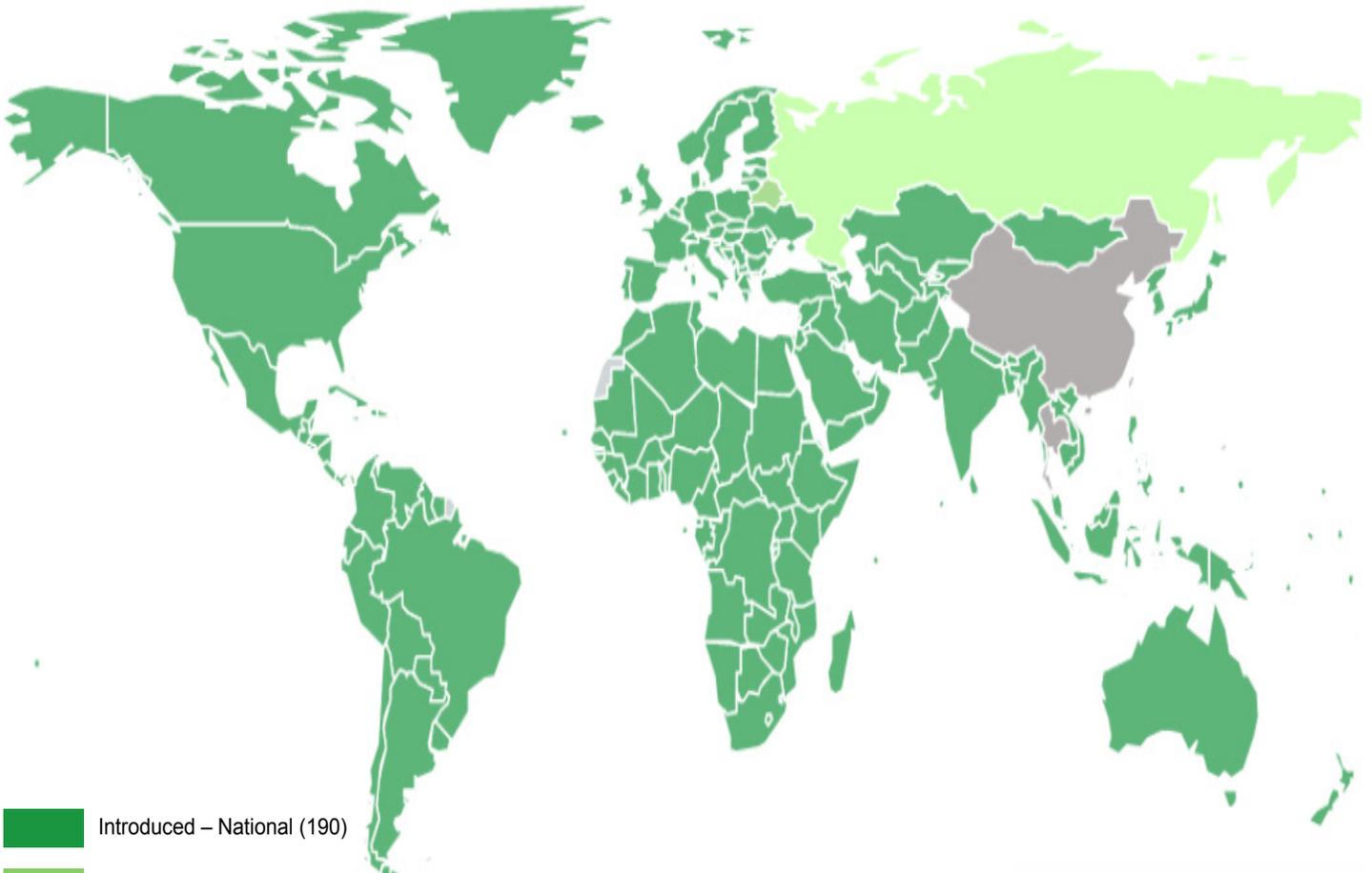
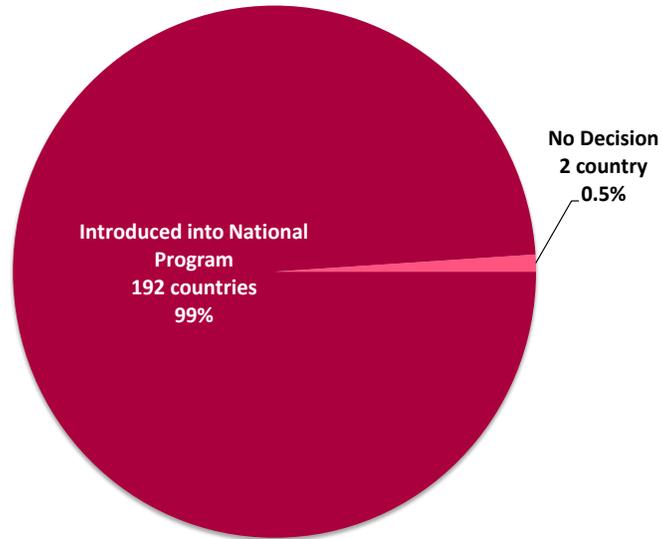
### Vaccine Introduction by Income Level

- Countries were classified using 2018 World Bank income classifications (2017 GNI data). Year of introduction or forecasted introduction was determined through WHO reports, news media, and Gavi's Strategic Demand Forecast v12.

## Global Hib Vaccine Introduction Status

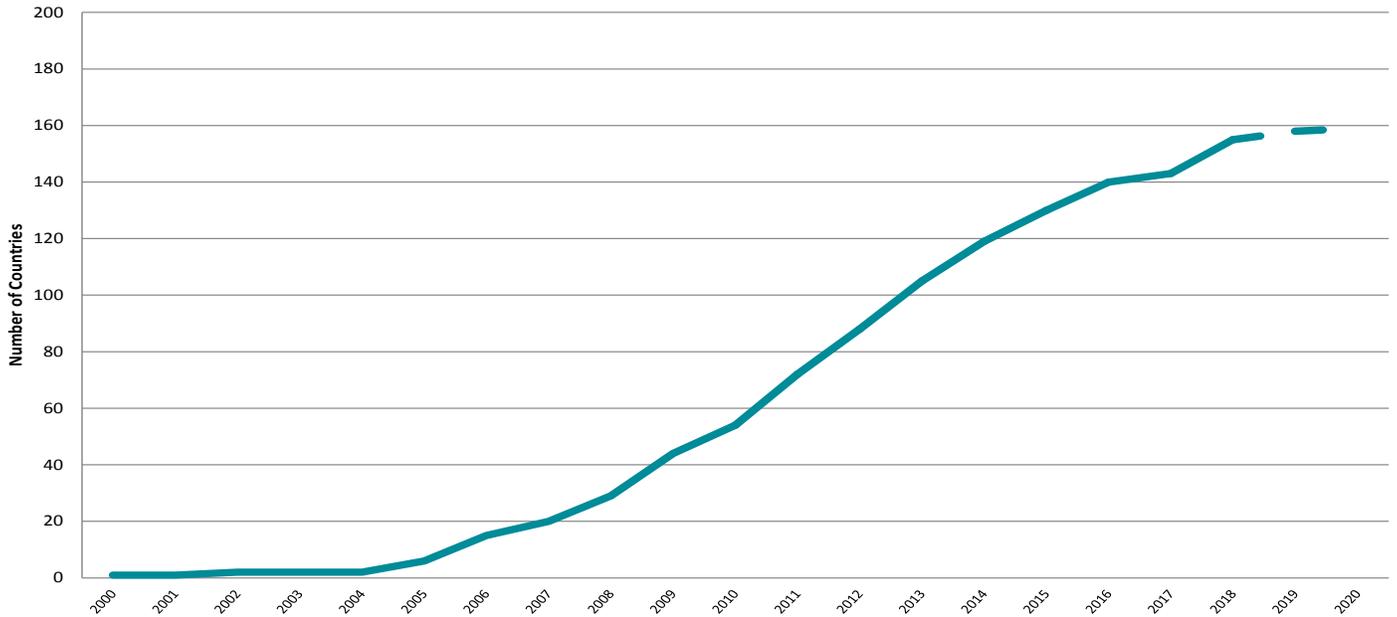
As of December 2018, 192 countries have introduced a Hib-containing vaccine into their National Immunization Program, Belarus introduced subnationally and Russia introduced to at risk populations. Two countries (Thailand and China) have yet to make a decision regarding introduction.

A map of countries that have introduced Hib vaccine is below.



- Introduced – National (190)
- Introduced – Subnational (1)
- Introduced – Risk Program (1)

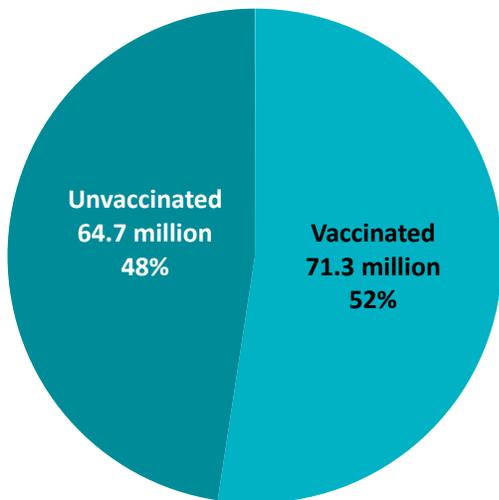
## Global PCV Introduction by Year



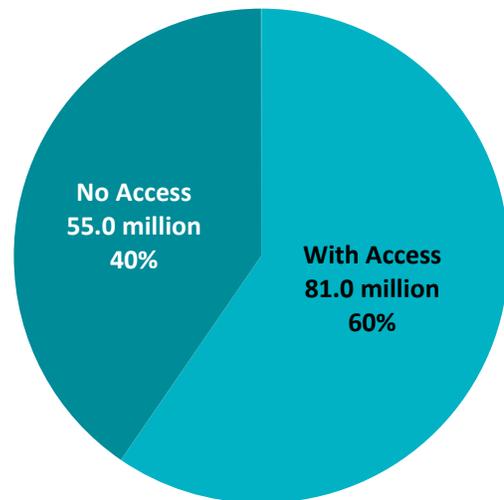
An estimated 48% of the world's infants (64.7 million) are not receiving PCV, according to 2017 WHO/UNICEF estimates of national immunization coverage. These children are unvaccinated because either their country has not yet introduced the vaccine (n=50), or they are not being reached by the routine immunization services in their country.

An estimated 40% of the world's infants (55.0 million) live in countries or subnational regions within countries that have not yet introduced PCV into their National Immunization Program (n=50).

**PCV Coverage  
(Global Surviving Infants)**



**PCV Access  
(Global Surviving Infants)**



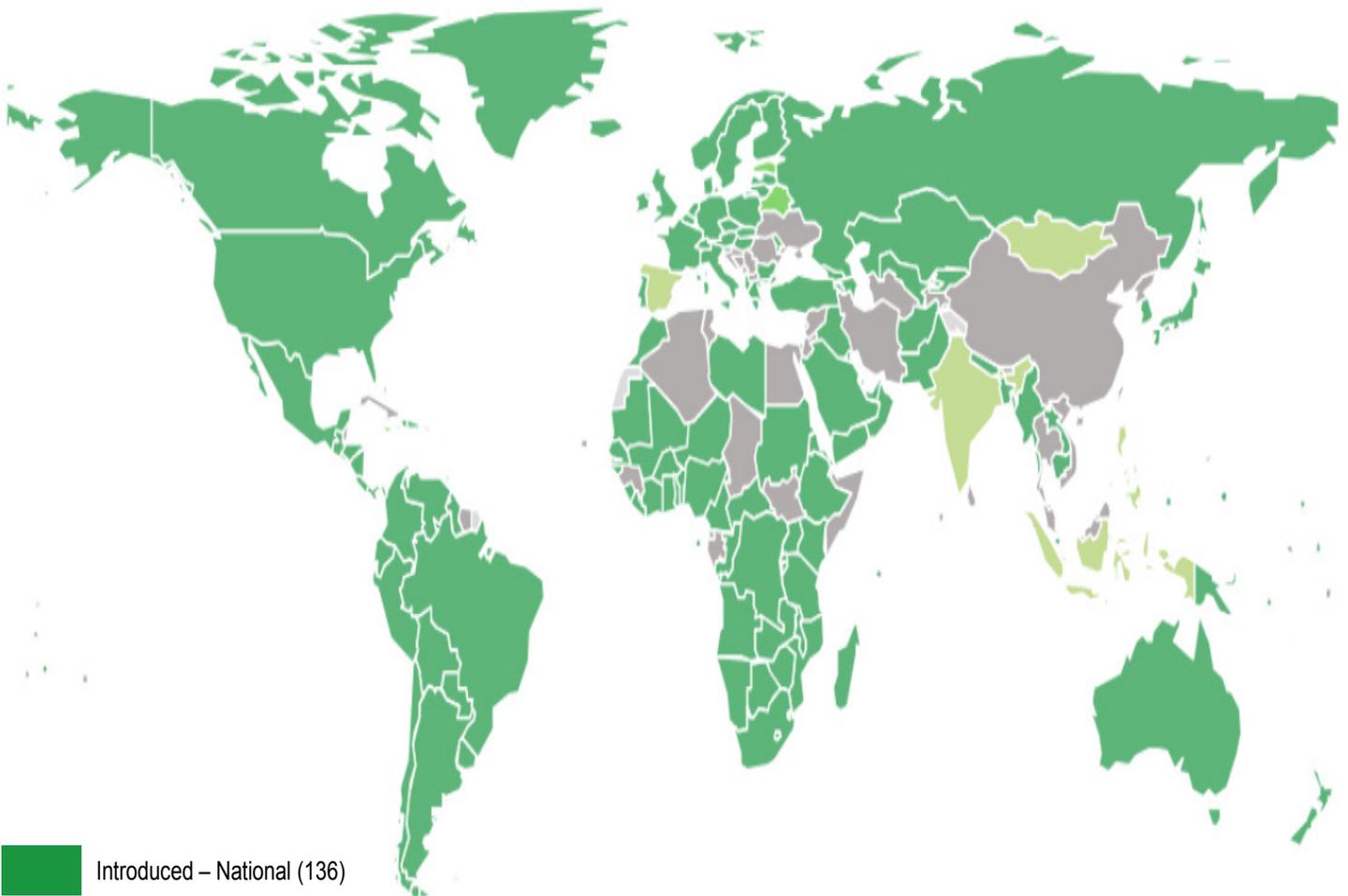
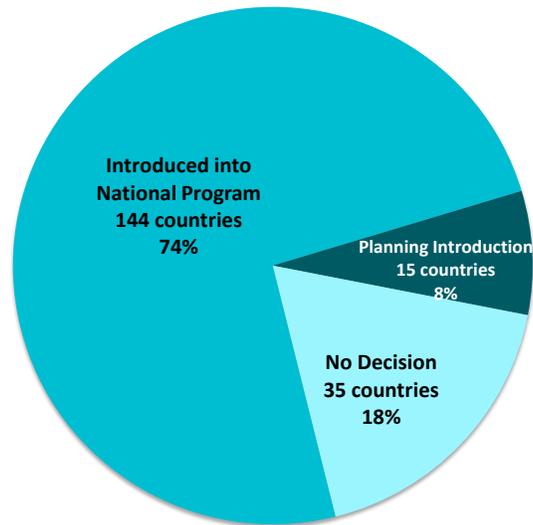
PCV coverage is calculated as the number of surviving infants globally covered by PCV3 in countries or subnational regions within countries that have introduced PCV. In the absence of PCV3 coverage data for 2017, DTP3 coverage was used as a proxy to estimate PCV coverage.

PCV access is calculated as the number of surviving infants globally that live in countries or subnational regions within countries that have introduced PCV.

## Global PCV Introduction Status

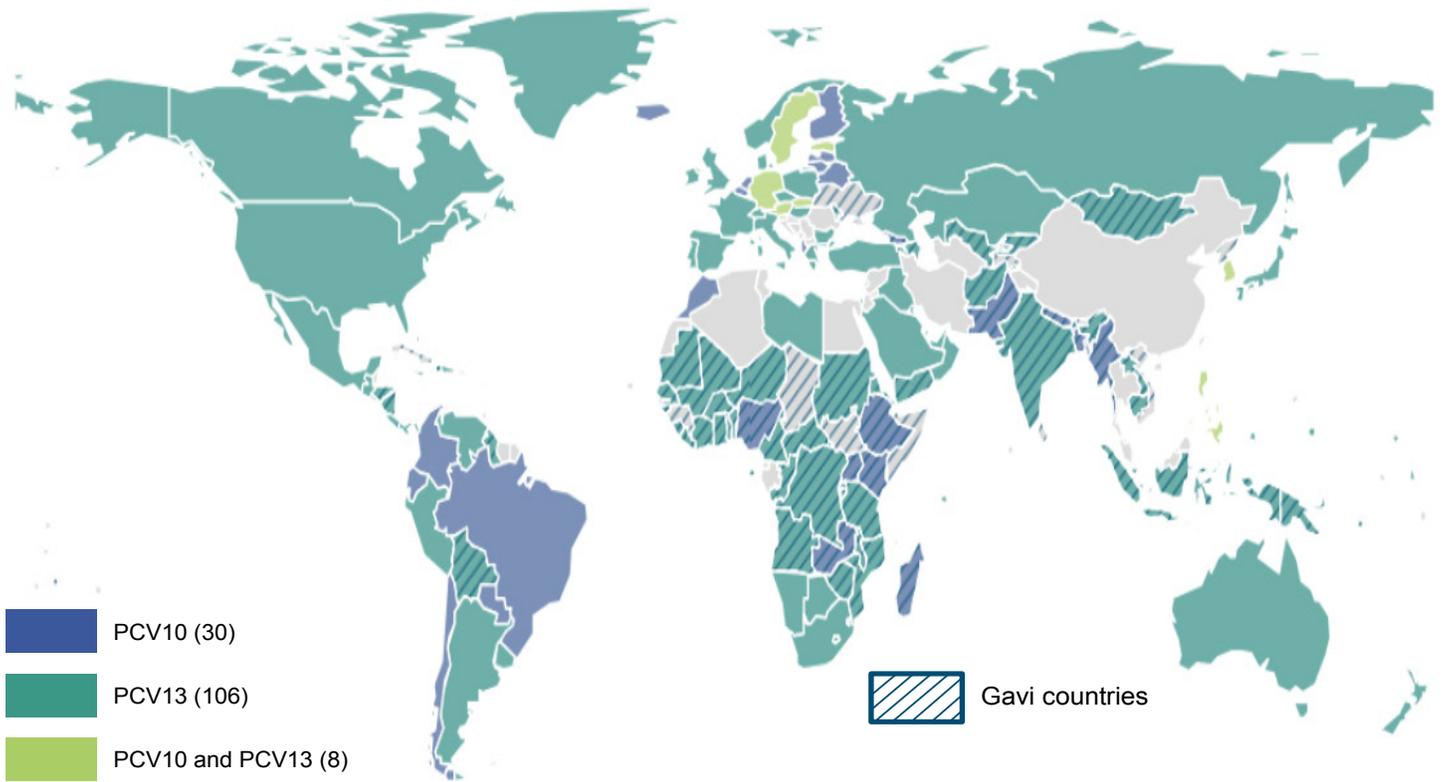
As of December 2018, 144 countries have introduced PCV into their National Immunization Program, including 136 universal, 5 subnational, and 3 risk programs. Fifteen countries have announced plans to introduce PCV into their NIP. Thirty-five countries have yet to make a decision regarding introduction.

A map of countries that have introduced PCV is below.

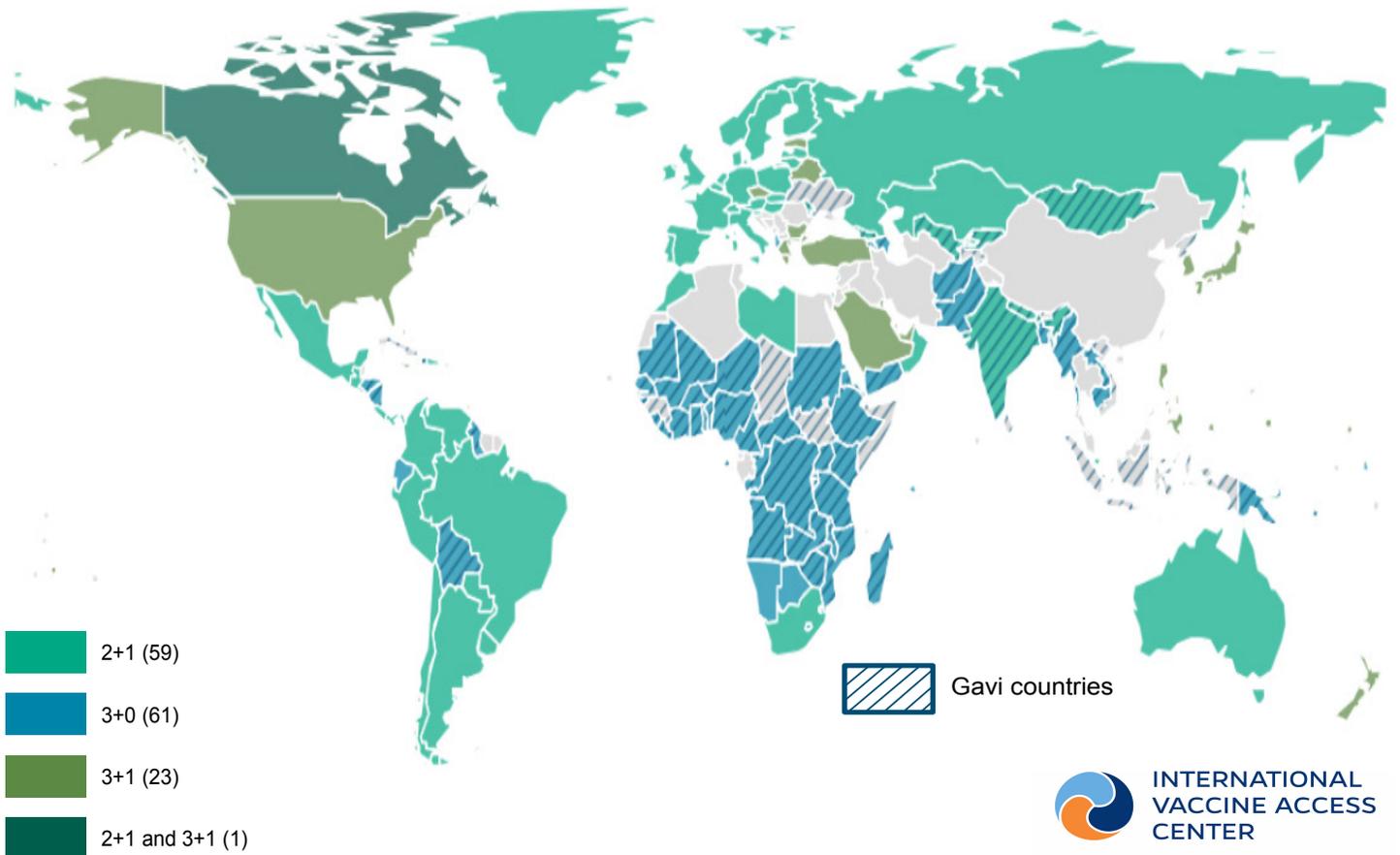


- Introduced – National (136)
- Introduced – Subnational (5)
- Introduced – Risk Program (3)

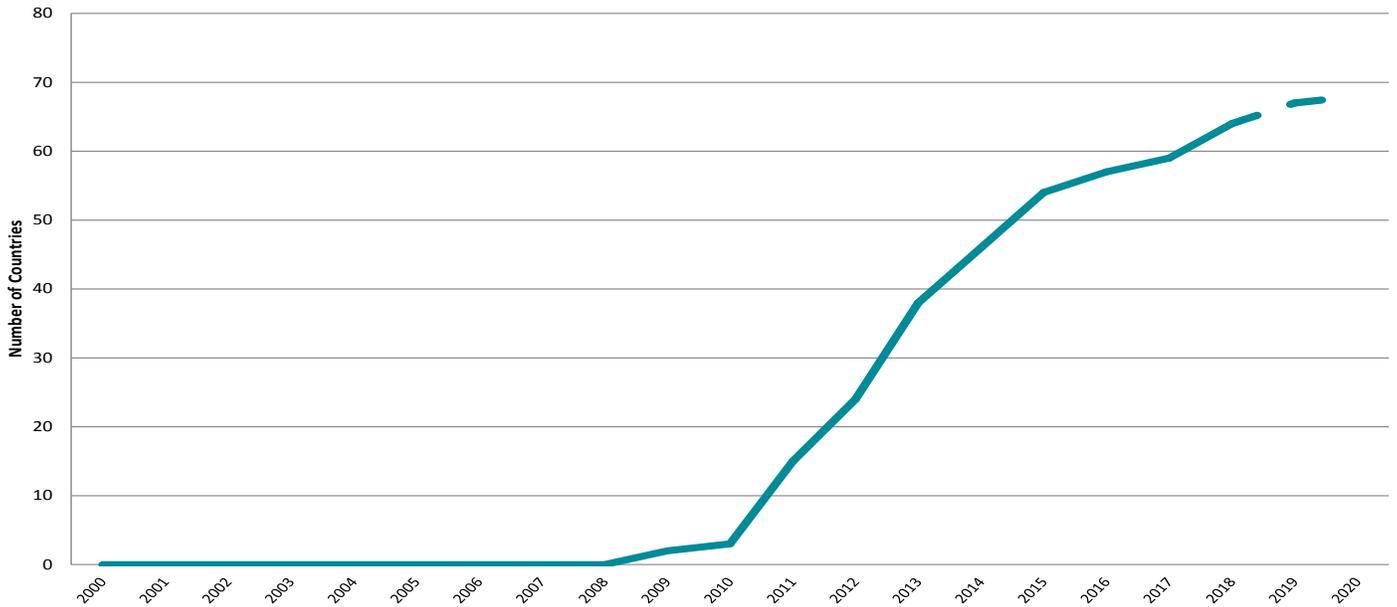
### PCV - Current Product



### PCV - Current Dosing Schedule



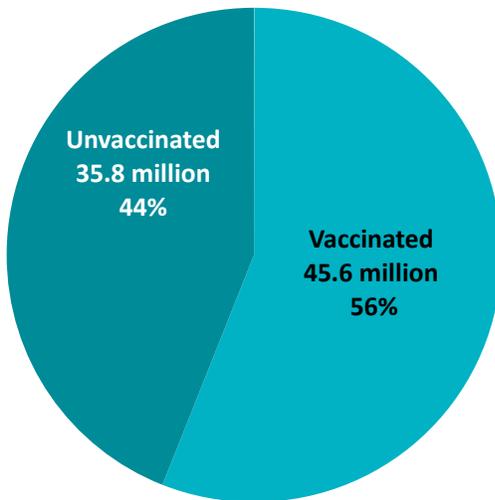
## Gavi PCV Introduction by Year



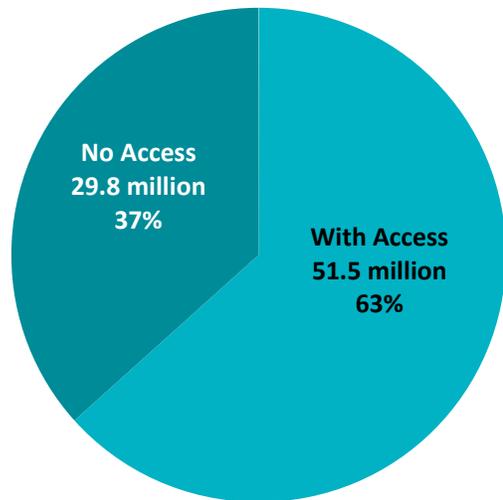
An estimated 44% of infants in Gavi countries (35.8 million) are not receiving PCV, according to 2017 WHO/UNICEF estimates of national immunization coverage. These children are unvaccinated because either their country has not yet introduced the vaccine (n=13), or they are not being reached by the routine immunization services in their country.

An estimated 37% of infants in Gavi countries (29.8 million) live in countries or subnational regions within Gavi countries that have not yet introduced PCV into their National Immunization Program (n=13).

**PCV Coverage  
(Gavi Surviving Infants)**



**PCV Access  
(Gavi Surviving Infants)**



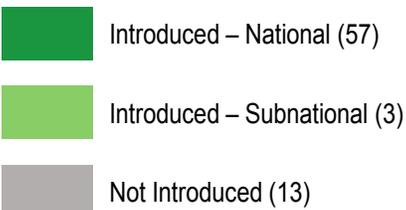
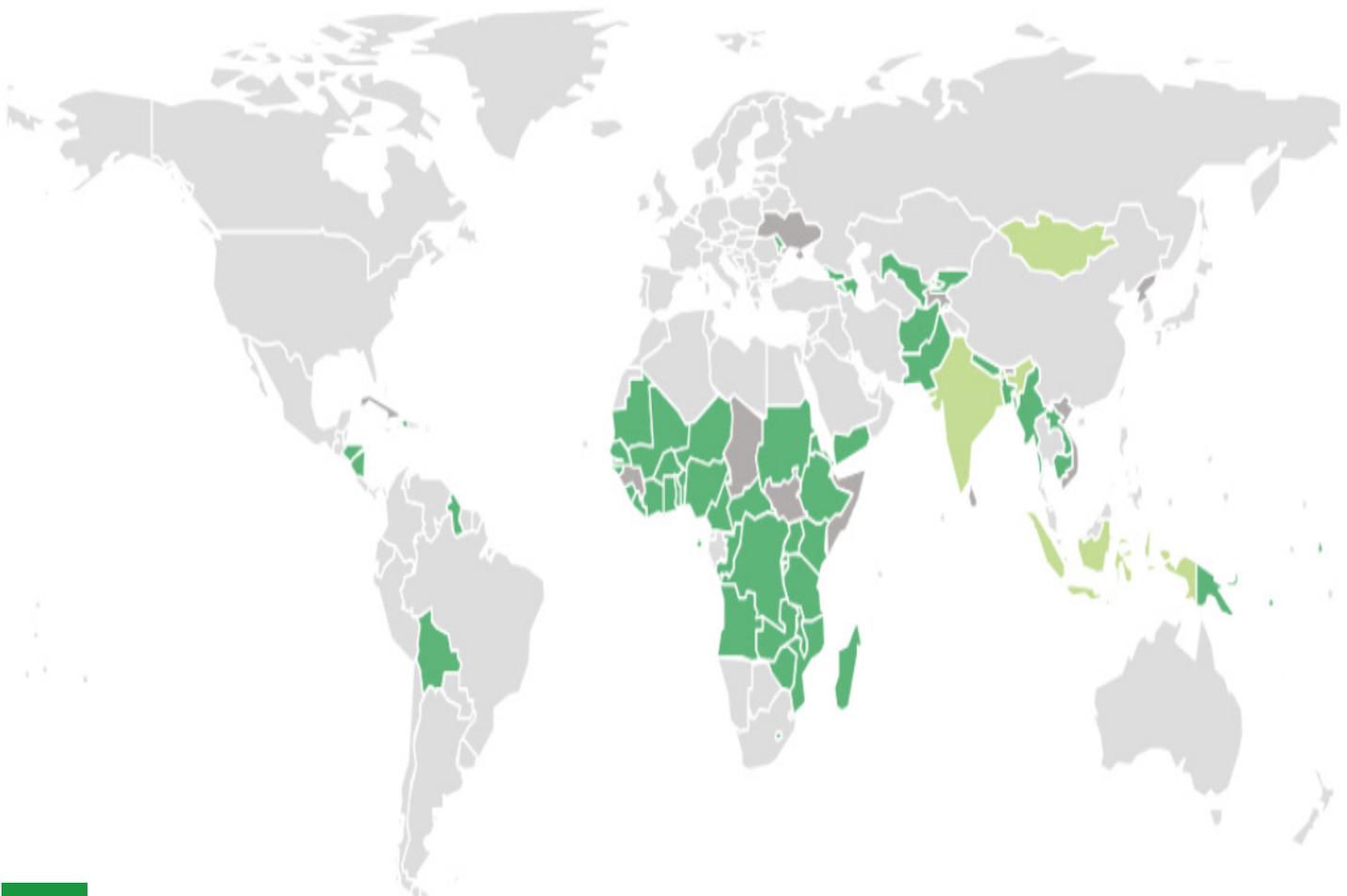
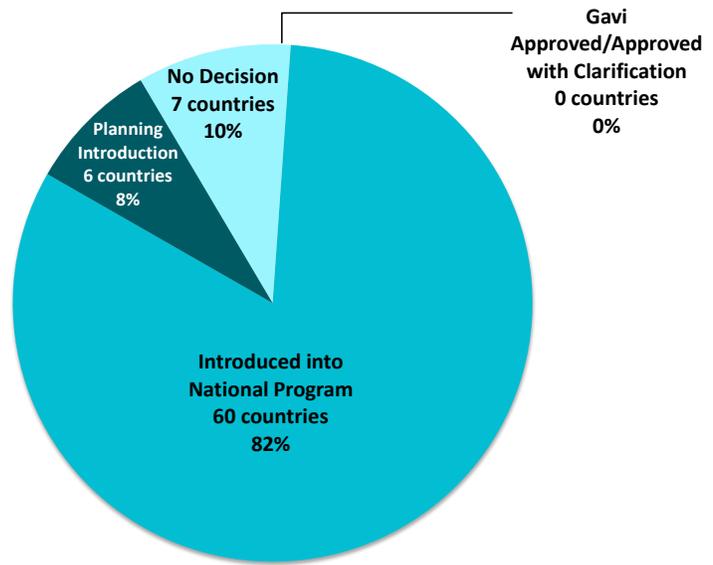
PCV coverage is calculated as the number of surviving infants covered by PCV3 in Gavi countries or subnational regions within Gavi countries that have introduced PCV. In the absence of PCV3 coverage data for 2017, DTP3 coverage was used as a proxy to estimate PCV coverage.

PCV access is calculated as the number of surviving infants that live in Gavi countries or subnational regions within Gavi countries that have introduced PCV.

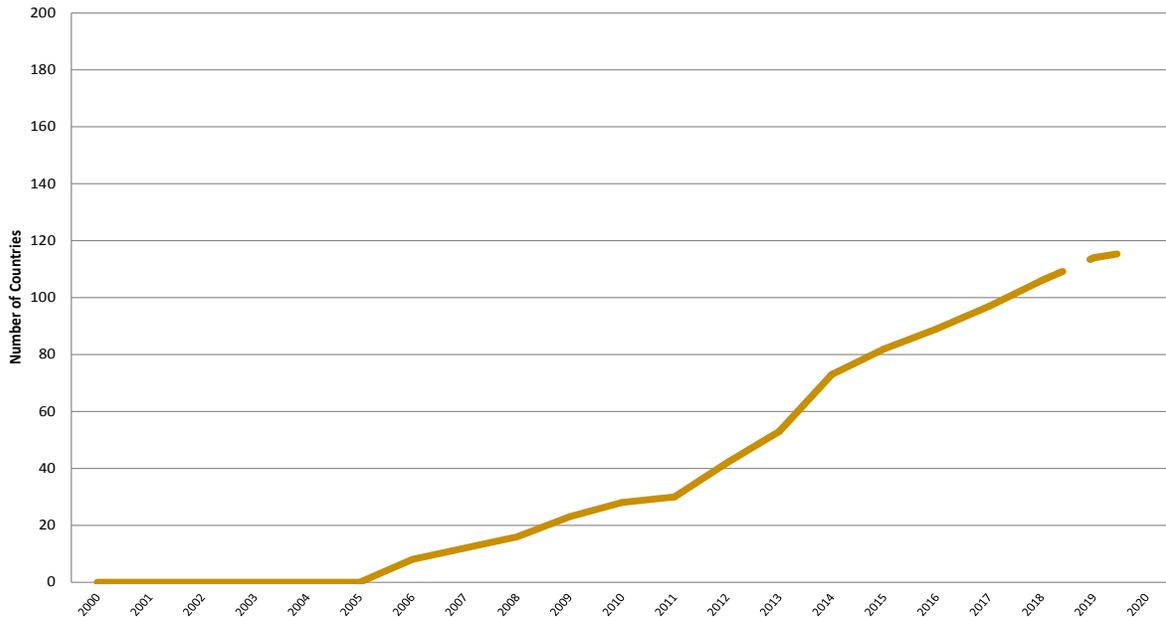
## Gavi PCV Introduction Status

As of December 2018, 60 countries have introduced PCV into their National Immunization Program. Six countries have announced plans to introduce PCV into their NIP. Seven countries have yet to make a decision regarding PCV.

A map of Gavi countries that have introduced PCV is below.



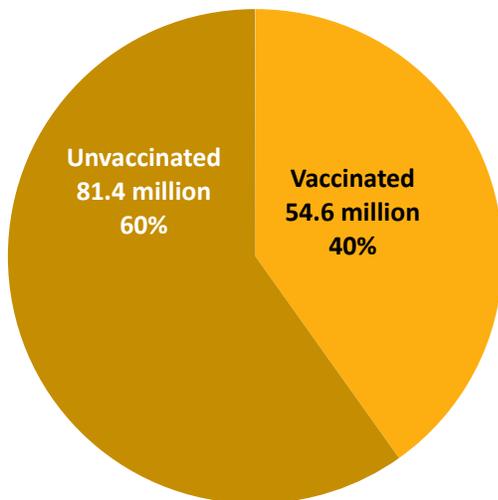
## Global Rotavirus Vaccine Introduction by Year



An estimated 60% of the world’s infants (81.4 million) are not receiving rotavirus vaccine, according to 2017 WHO/UNICEF estimates of national immunization coverage. These children are unvaccinated because either their country has not yet introduced the vaccine (n=97), or they are not being reached by the routine immunization services in their country.

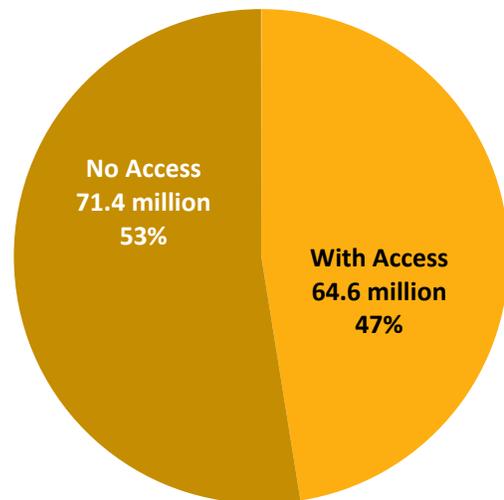
An estimated 53% of the world’s infants (71.5 million) live in countries or subnational regions within countries that have not yet introduced rotavirus vaccine into their National Immunization Program (n=97).

**Rotavirus Vaccine Coverage  
(Global Surviving Infants)**



Rotavirus vaccine coverage is calculated as the number of surviving infants covered by the last dose of rotavirus vaccine in countries or subnational regions within countries that have introduced rotavirus vaccine. In the absence of rotavirus vaccine coverage data for 2017, DTP3 coverage was used as a proxy to estimate rotavirus vaccine coverage.

**Rotavirus Vaccine Access  
(Global Surviving Infants)**

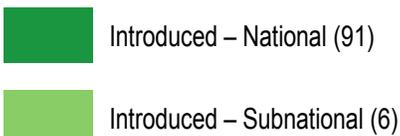
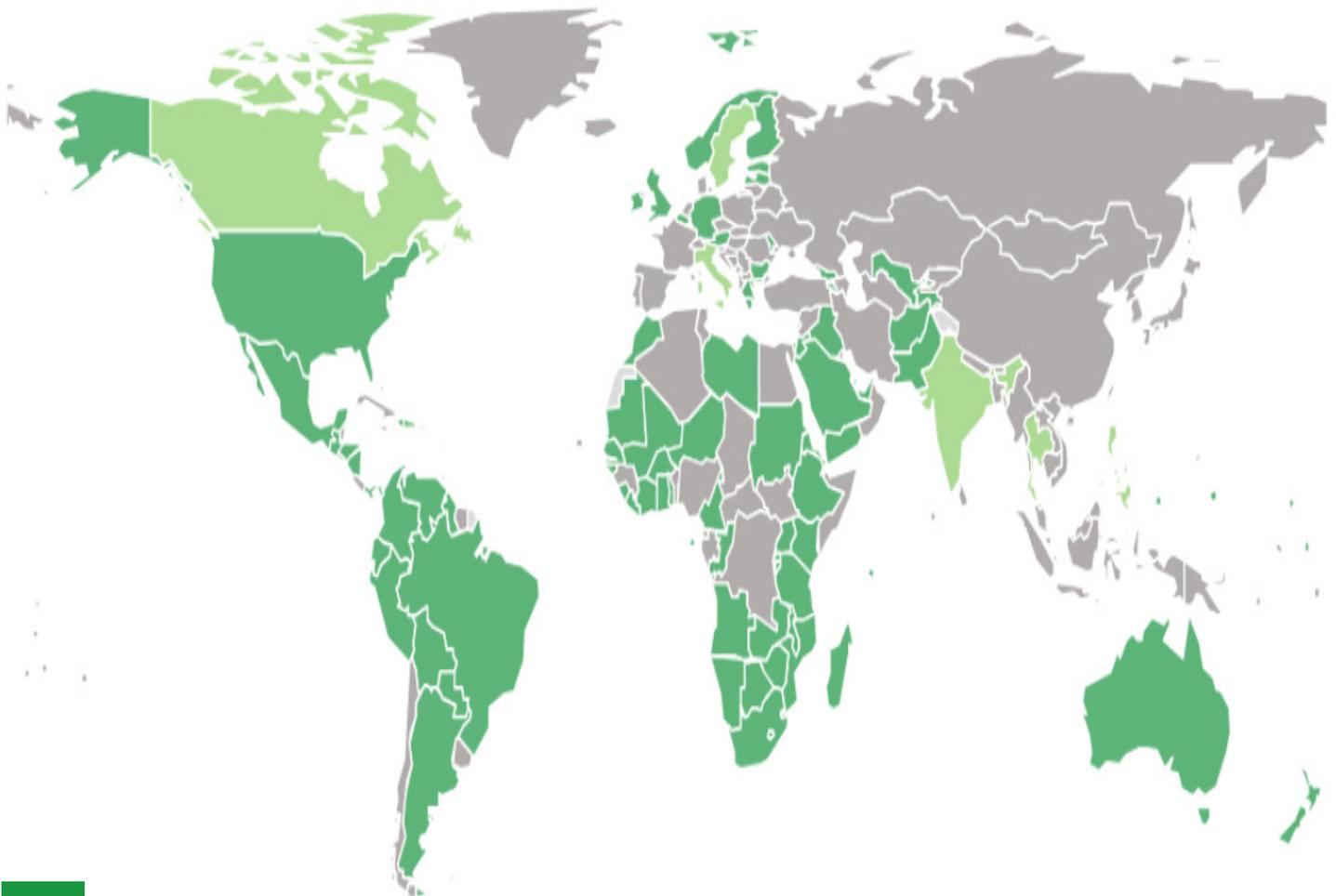
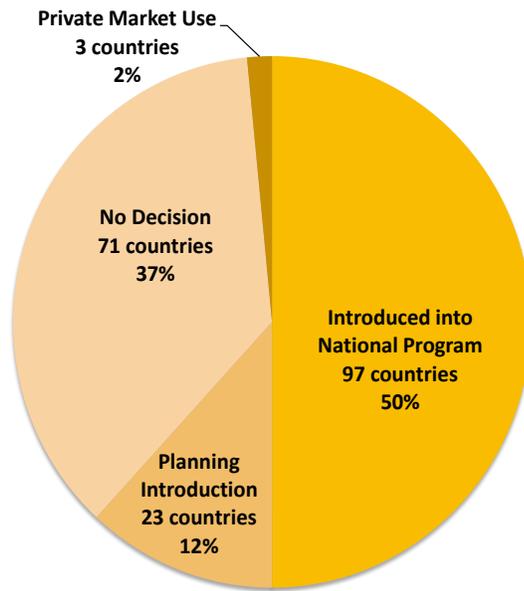


Rotavirus vaccine access is calculated as the number of surviving infants globally that live in countries or subnational regions within countries that have introduced rotavirus vaccine.

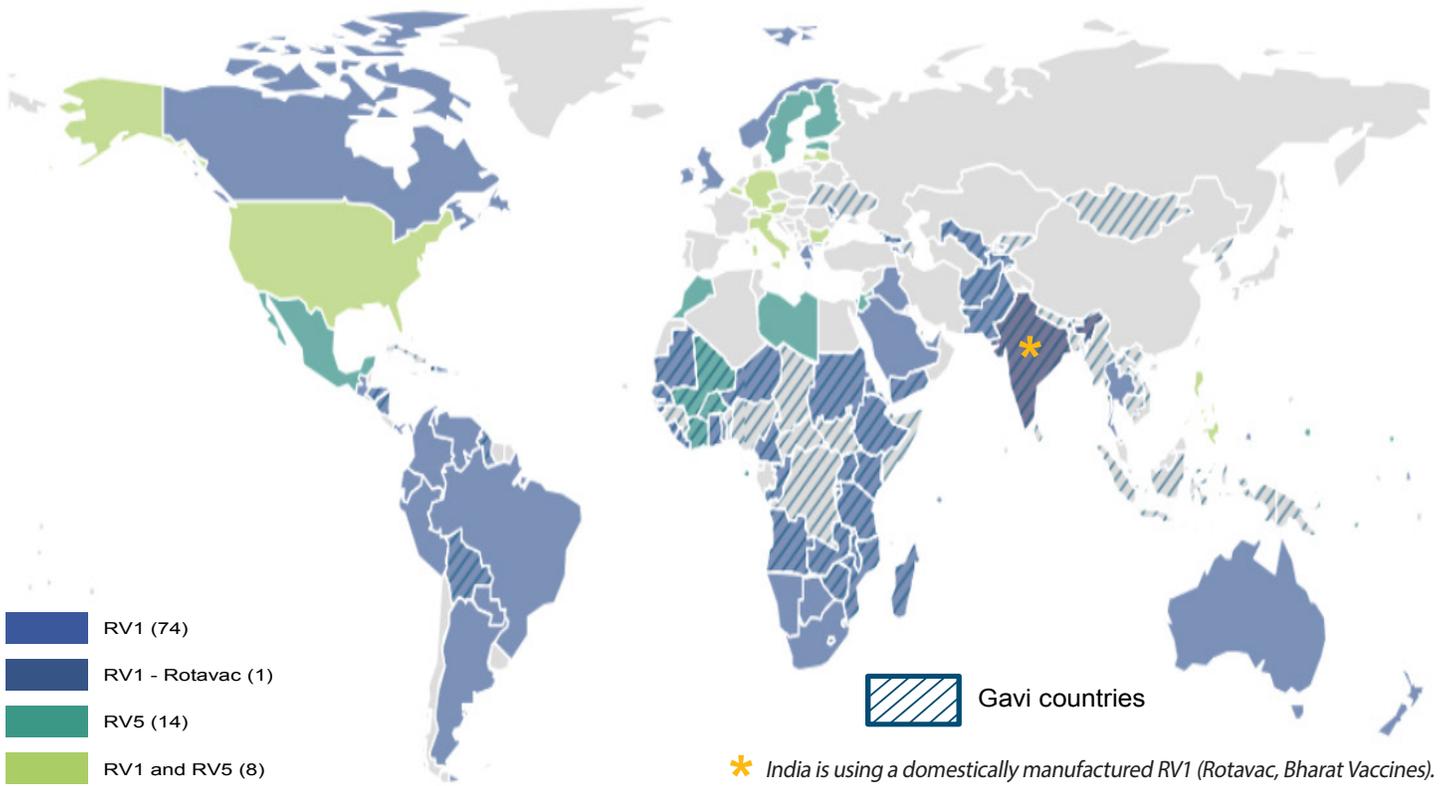
## Global Rotavirus Vaccine Introduction Status

As of December 2018, 97 countries have introduced rotavirus vaccine into their National Immunization Program; six of these countries have introduced subnationally. Twenty-three countries have announced plans to introduce rotavirus vaccine into their NIP. Three countries are known to have coverage through the private market. Seventy-one countries have yet to make a decision regarding introduction.

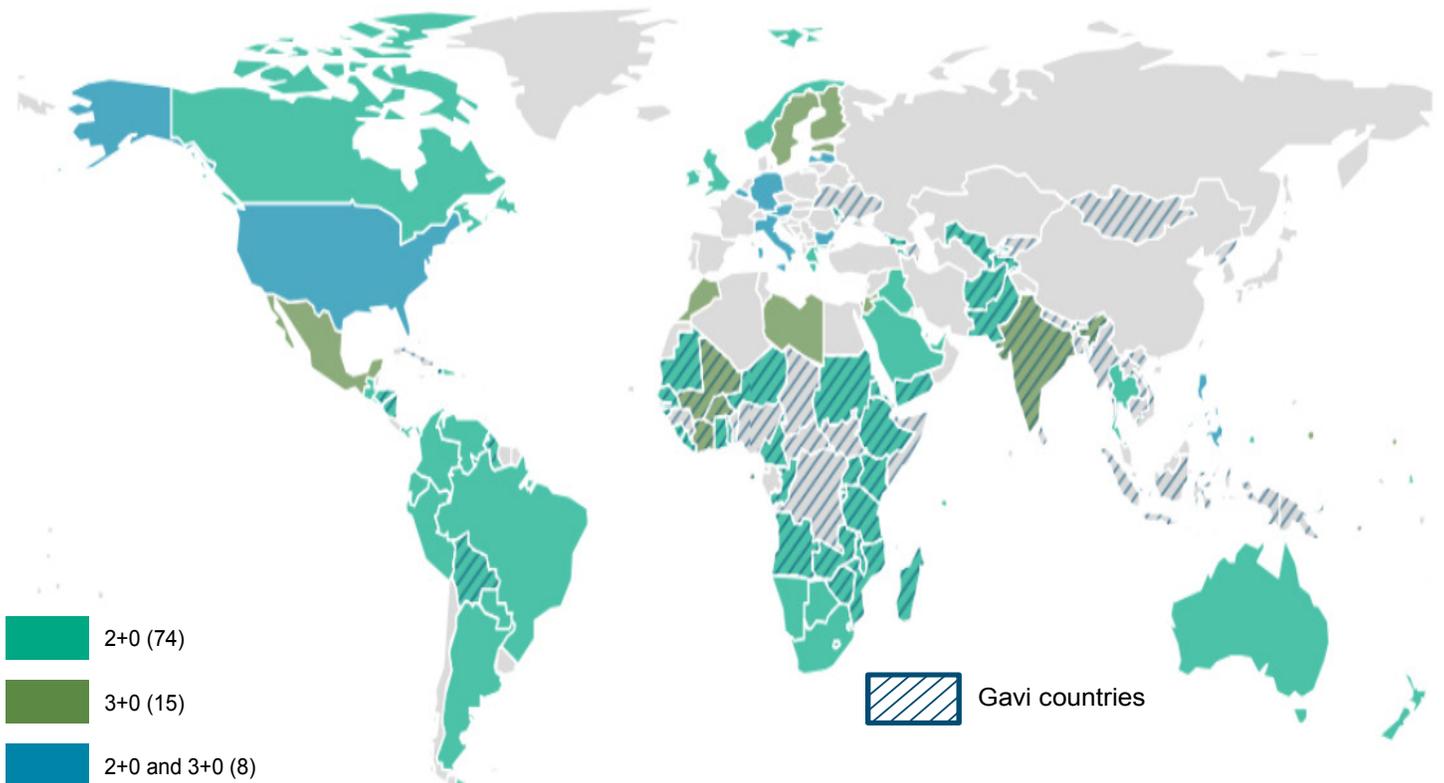
A map of countries that have introduced rotavirus vaccine is below.



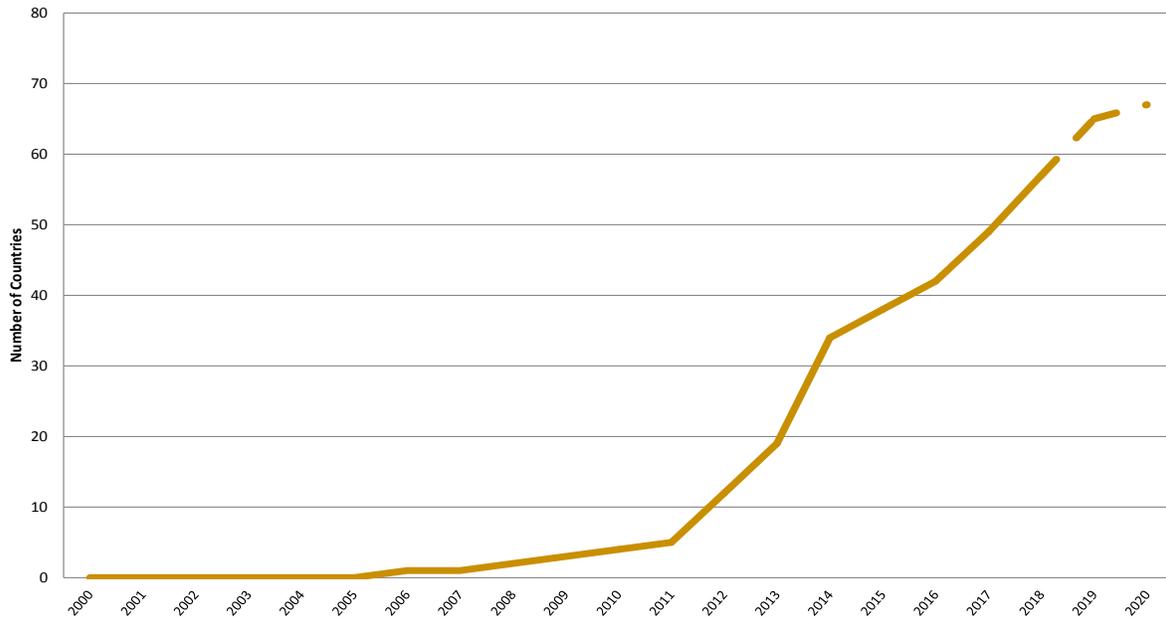
## Rotavirus Vaccine - Current Product



## Rotavirus Vaccine - Current Dosing Schedule



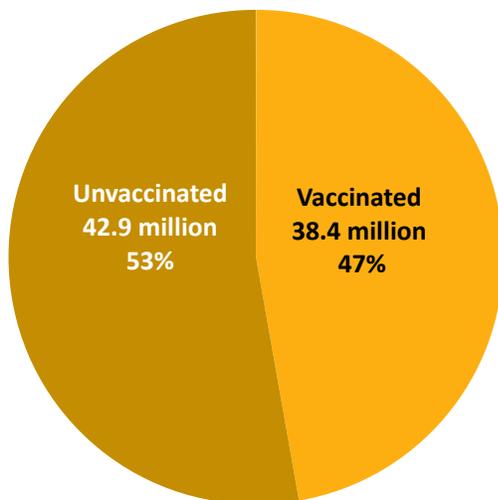
## Gavi Rotavirus Vaccine Introduction by Year



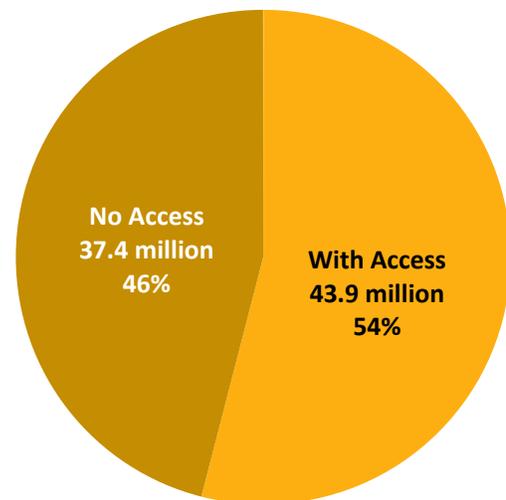
An estimated 53% of infants in Gavi countries (42.9 million) are not receiving rotavirus vaccine, according to 2017 WHO/UNICEF estimates of national immunization coverage. These children are unvaccinated because either their country has not yet introduced the vaccine (n=27), or they are not being reached by the routine immunization services in their country.

An estimated 46% of infants in Gavi countries (37.4 million) live in countries or regions that have not yet introduced rotavirus vaccine into their National Immunization Program (n=27).

### Rotavirus Vaccine Coverage (Gavi Surviving Infants)



### Rotavirus Vaccine Access (Gavi Surviving Infants)



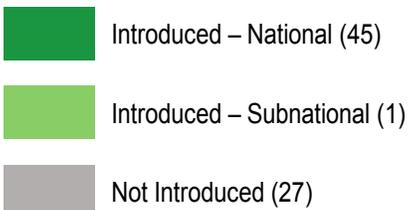
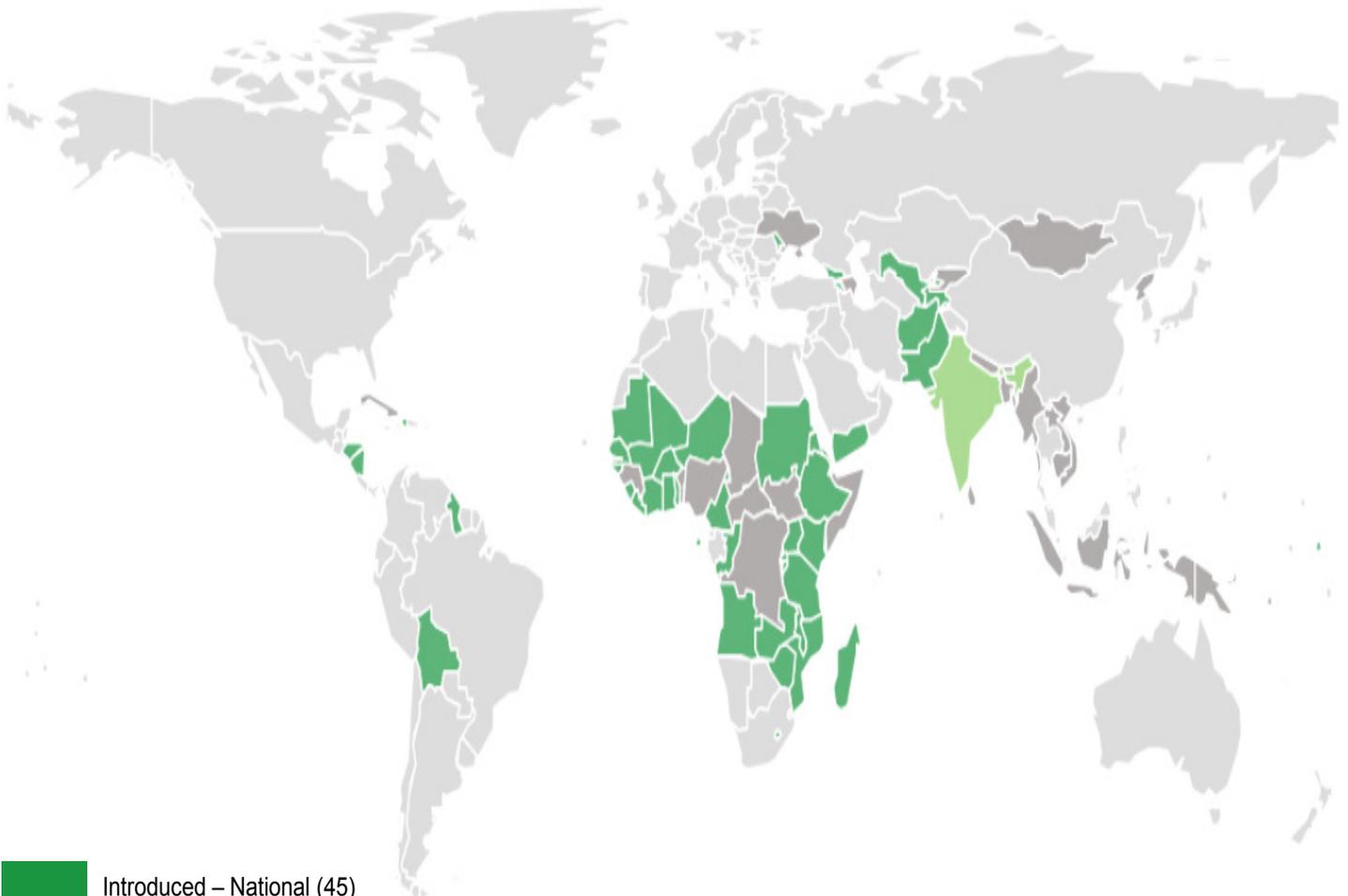
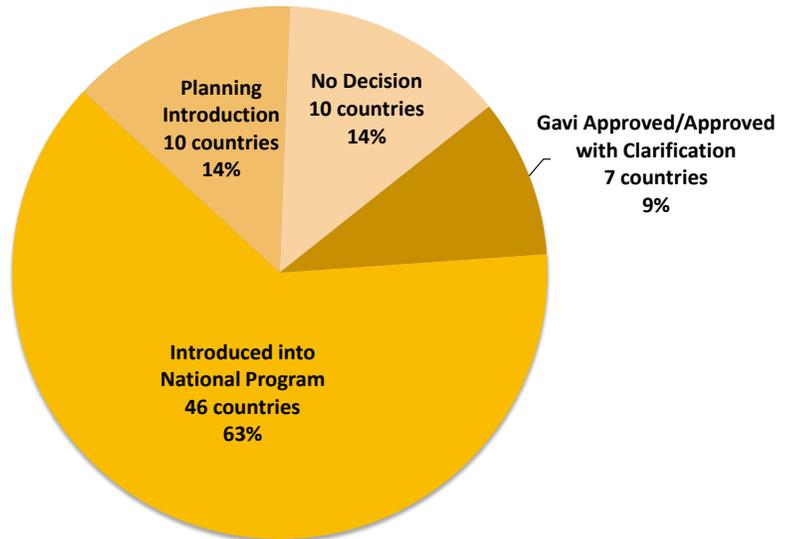
Rotavirus vaccine coverage is calculated as the number of surviving infants covered by the last dose of rotavirus vaccine in Gavi countries or subnational regions within Gavi countries that have introduced rotavirus vaccine. In the absence of rotavirus vaccine coverage data for 2017, DTP3 coverage was used as a proxy to estimate rotavirus vaccine coverage.

Rotavirus vaccine access is calculated as the number of surviving infants that live in Gavi countries or subnational regions within Gavi countries that have introduced rotavirus vaccine.

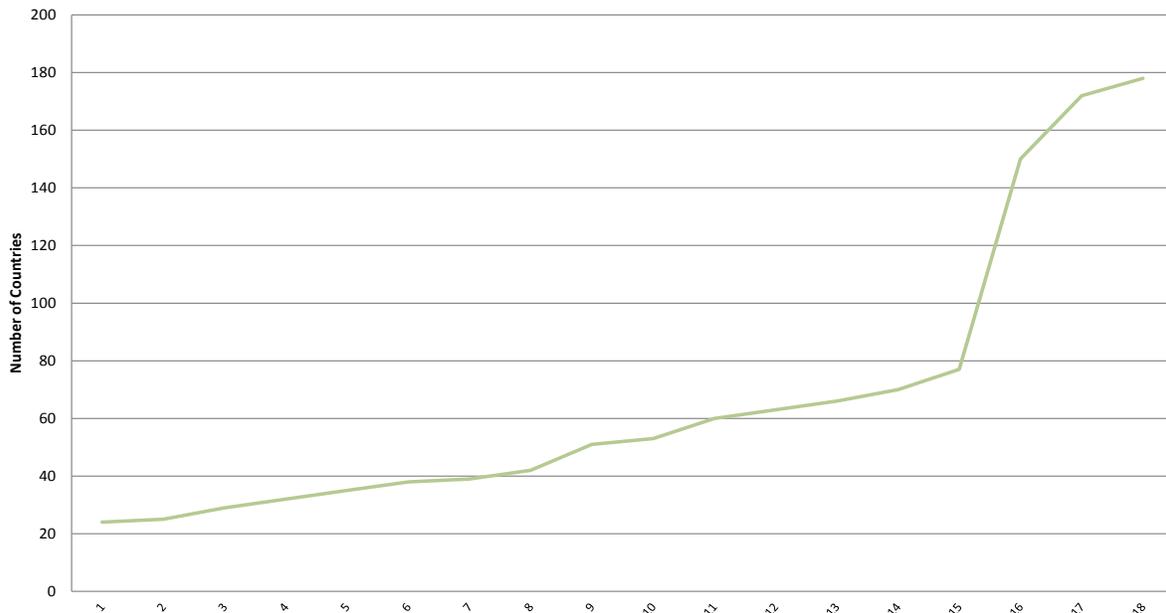
## Gavi Rotavirus Vaccine Introduction Status

As of December 2018, 46 countries have introduced rotavirus vaccine into their National Immunization Program, India has introduced in a phased manner. Seven countries are approved, with or without clarification, for Gavi support to introduce. Ten countries have announced plans to introduce rotavirus vaccine into their NIP. Ten countries have yet to make a decision regarding introduction.

A map of Gavi countries that have introduced rotavirus vaccine is below.



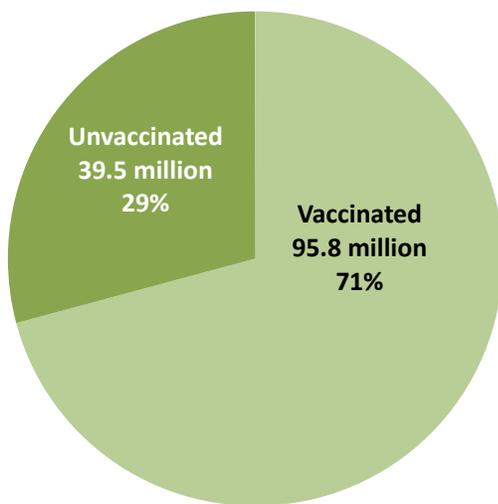
## Global IPV Introduction by Year



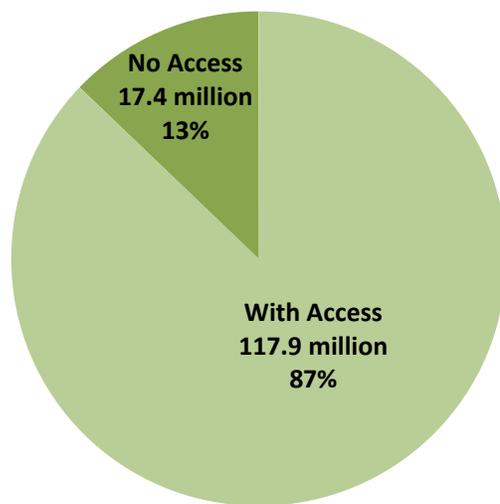
An estimated 29% of the world’s infants (39.5 million) are not receiving IPV, according to 2017 WHO/UNICEF estimates of national immunization coverage. These children are unvaccinated because either their country has not yet introduced the vaccine (n=3), largely because of supply constraints (since all countries have made the decision to introduce), or they are not being reached by the routine immunization services in their country.

An estimated 13% of the world’s infants (17.3 million) live in countries or regions that have not yet introduced IPV into their National Immunization Program (n=3).

**IPV Coverage  
(Global Surviving Infants)**



**IPV Access  
(Global Surviving Infants)**



IPV coverage is calculated as the number of surviving infants covered by IPV in countries or subnational regions within countries that have introduced IPV. In the absence of IPV coverage data for 2017, DTP3 rates were used as a proxy to estimate IPV coverage.

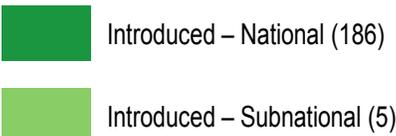
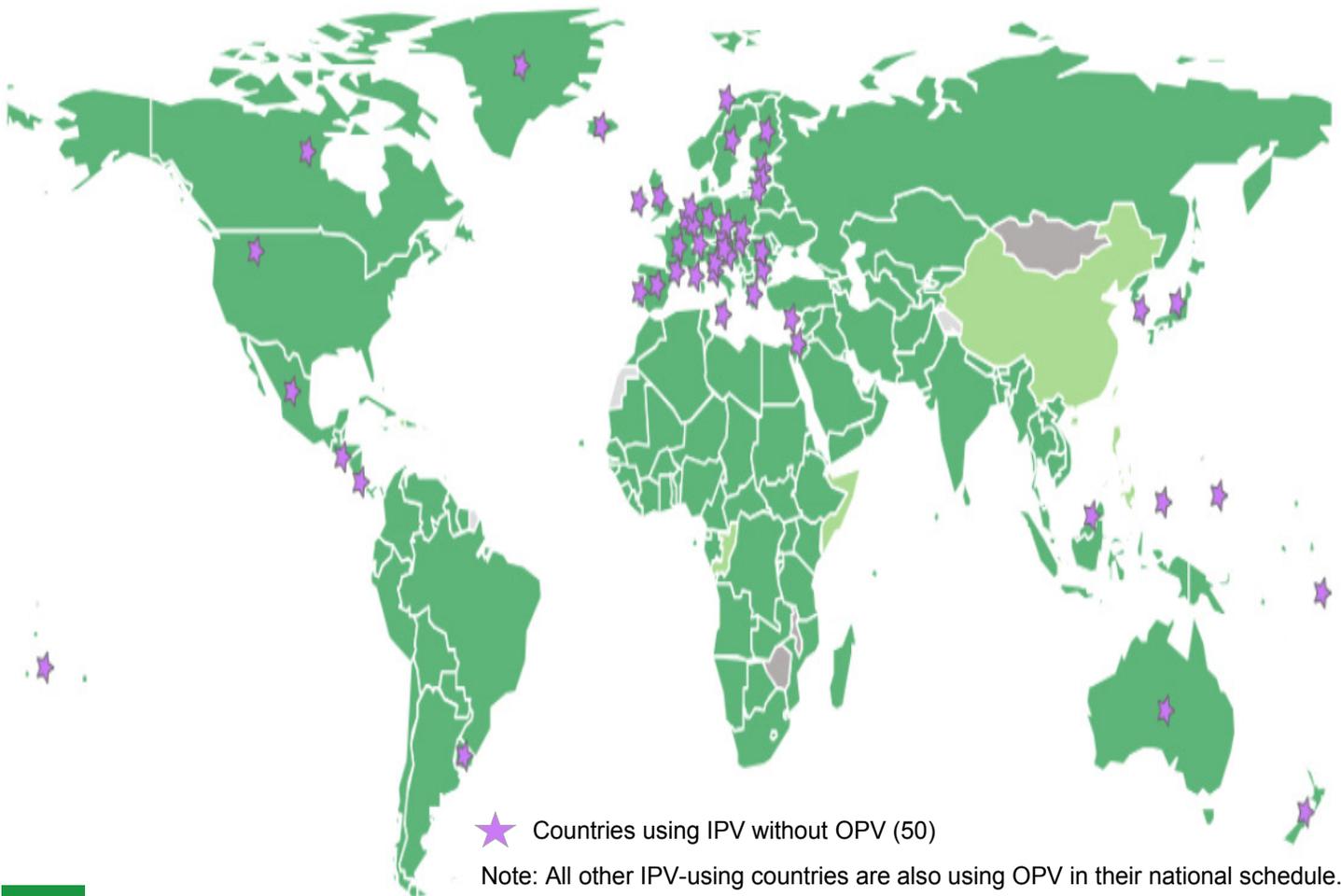
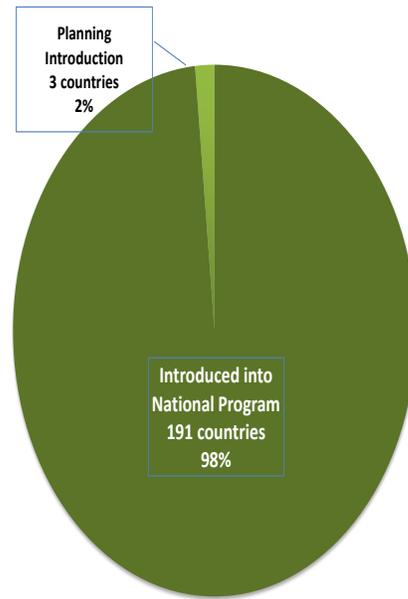
IPV access is calculated as the number of surviving infants globally that live in countries or subnational regions within countries that have introduced IPV.

## Global IPV Introduction Status

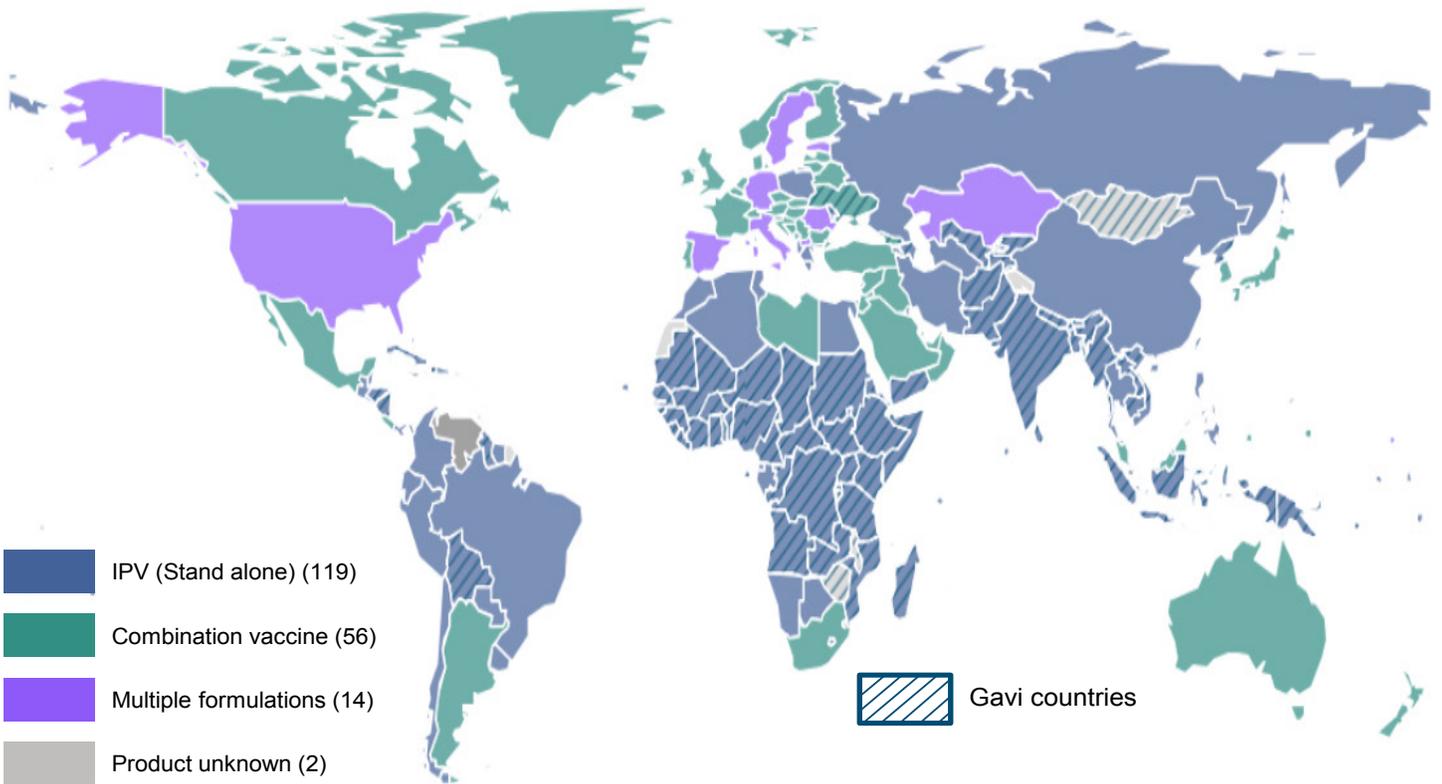
As of December 2018, 191 countries have introduced IPV into their National Immunization Program; among these, five countries have introduced subnationally. Three countries have announced plans to introduce IPV into their NIP.

Currently, 50 countries are using IPV exclusively and 141 countries are using both IPV and OPV in their national immunization schedule.

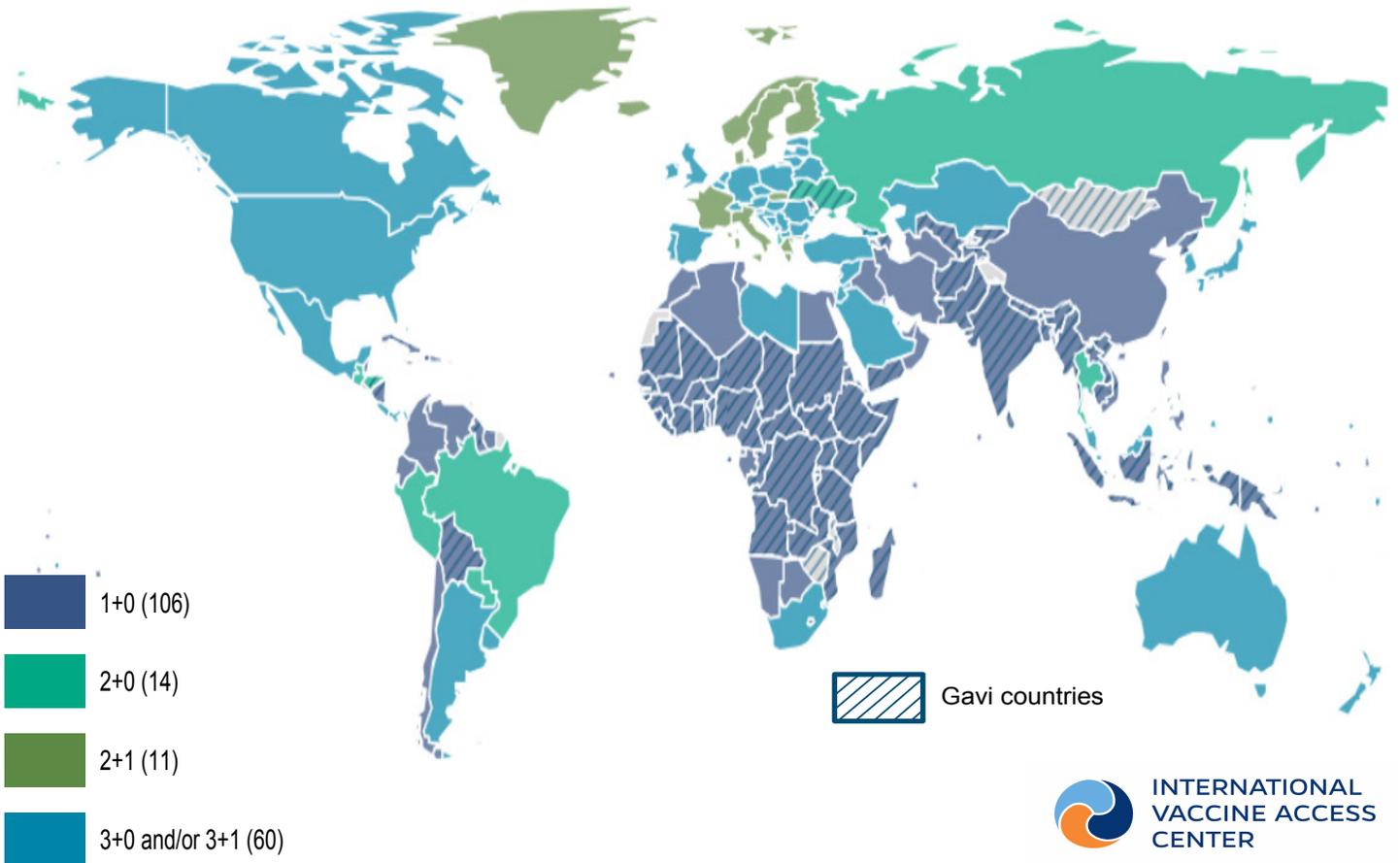
A map of countries that have introduced IPV is below.



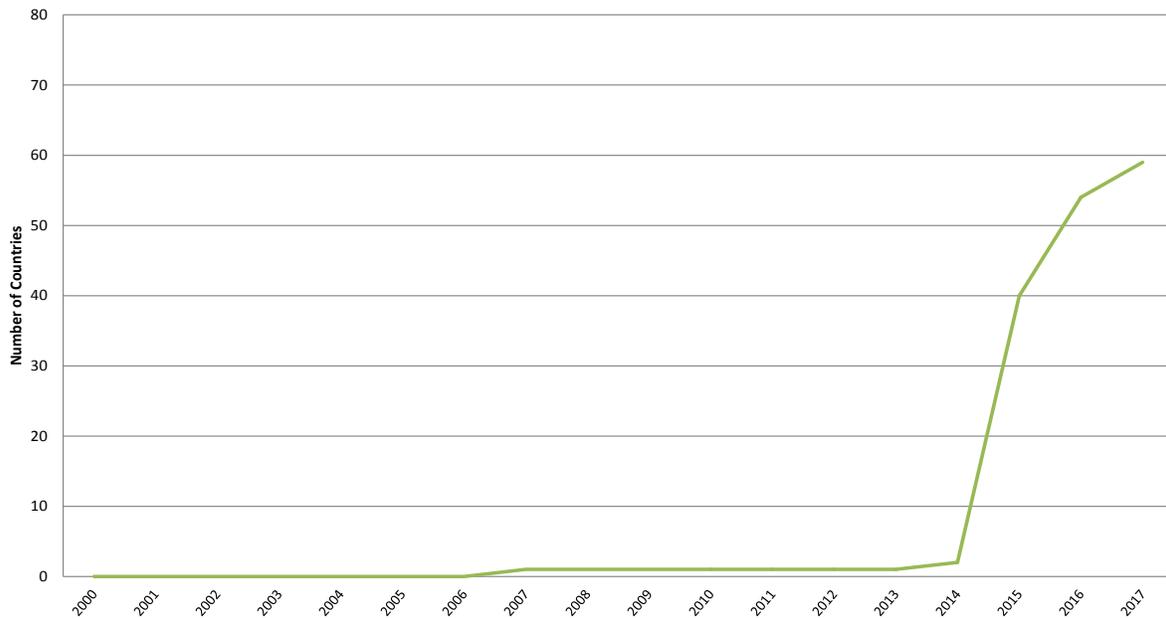
### IPV - Current Product



### IPV - Current Dosing Schedule



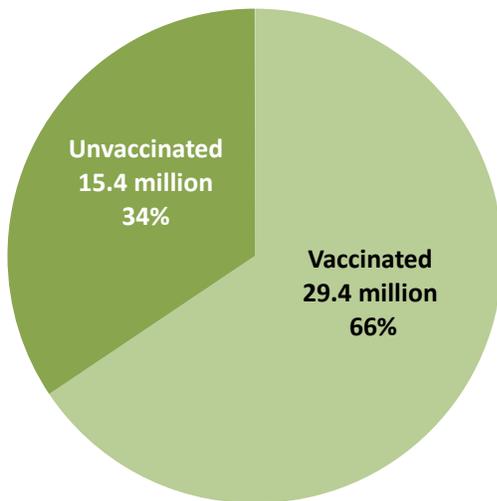
## Gavi IPV Introduction by Year



An estimated 34% percent of infants in Gavi countries (15.4 million) are not receiving IPV, according to 2017 WHO/UNICEF estimates of national immunization coverage. These children are unvaccinated because either their country has not yet introduced the vaccine, or they are not being reached by the routine immunization services in their country.

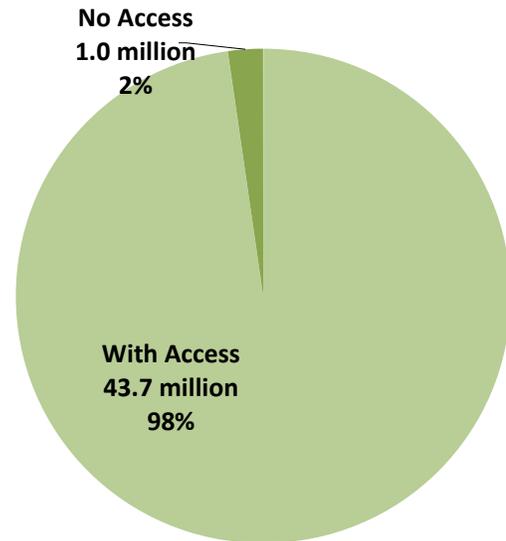
An estimated 2% of infants in Gavi countries (1.0 million) live in countries or subnational regions within Gavi countries that have not yet introduced IPV into their National Immunization Program.

**IPV Coverage  
(Gavi Surviving Infants)**



IPV coverage is calculated as the number of surviving infants covered by IPV in Gavi countries or subnational regions within Gavi countries that have introduced IPV. In the absence of IPV coverage data for 2017, DTP3 rates were used as a proxy to estimate IPV coverage.

**IPV Access  
(Gavi Surviving Infants)**



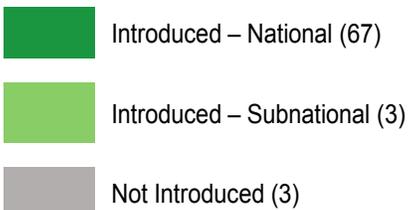
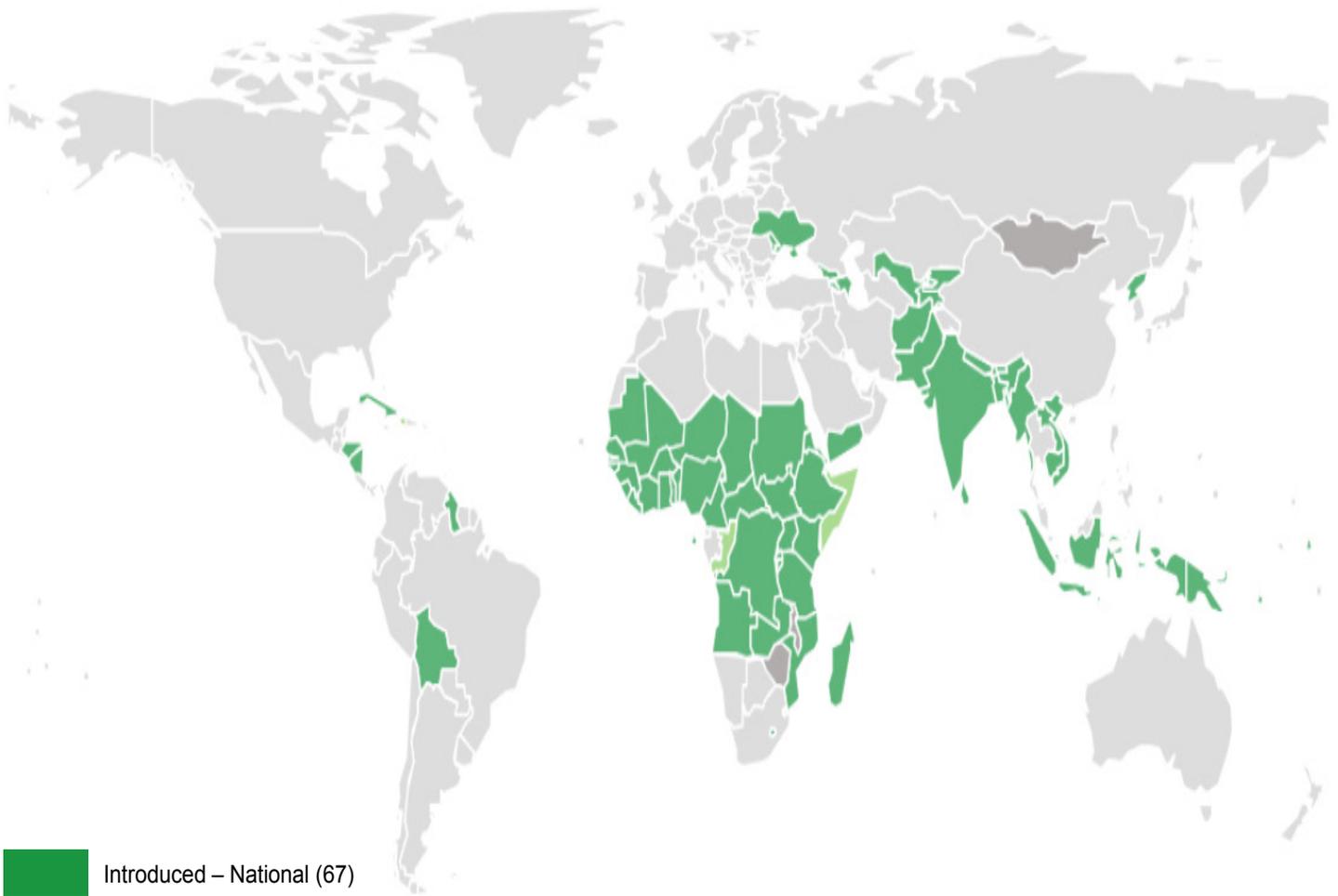
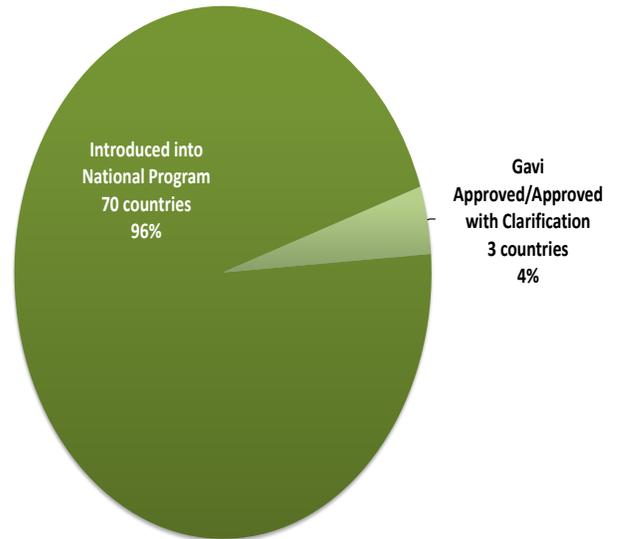
IPV access is calculated as the number of surviving infants that live in Gavi countries or subnational regions within Gavi countries that have introduced IPV.

## Gavi IPV Introduction Status

As of December 2018, 70 countries have introduced IPV into their National Immunization Program, three of which have introduced subnationally. Three countries are approved, with or without clarification, for Gavi support to introduce.

Currently, all 70 Gavi countries that have introduced IPV are using both IPV and OPV in their national immunization schedule.

A map of Gavi countries that have introduced IPV is below.



## ACKNOWLEDGEMENTS AND NOTES

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This report and VIEW-hub are supported by Gavi, The Vaccine Alliance and the Bill & Melinda Gates Foundation. This report has been generated using data and maps from VIEW-hub, developed and maintained by the International Vaccine Access Center (IVAC) at the Johns Hopkins Bloomberg School of Public Health for use by IVAC and its affiliated projects and partners. VIEW-hub is a new publicly-accessible interactive platform that allows real-time visualization of data on vaccine introduction, use, and impact. Information was gathered from internationally-recognized sources, such as WHO, Gavi, UNICEF, vaccine manufacturers, ministries of health, and news media.

Please note that all forecasted dates in this report rest on assumptions and actual dates may vary. Vaccine introduction dates do not imply an obligation by Gavi to support coverage.

Disclaimer: The presentation of VIEW-hub maps in this report is not by any means an expression of IVAC's opinion regarding the legal status of countries/territories, their governing authorities, or their official boundaries. On VIEW-hub's website, country borders which are not in full agreement are displayed with dotted lines, which may be difficult to visualize at the global view presented in this report.

Definitions and sources are available within VIEW-hub at [www.VIEW-hub.org](http://www.VIEW-hub.org).

This report and the PowerPoint slides with the report graphics can be found at: <http://www.jhsph.edu/research/centers-and-institutes/ivac/view-hub/>. All maps shown in this report were generated on [VIEW-hub](http://www.VIEW-hub.org) and can be replicated/updated on the site.

For any VIEW-hub-related inquiries, please email Kirthini Muralidharan at [kmurali2@jhu.edu](mailto:kmurali2@jhu.edu).

## SOURCES

Gavi Eligibility Status	Gavi, The Vaccine Alliance. Gavi Eligible Countries. 2016. Last accessed Jan 2016 at <a href="http://www.gavialliance.org/support/apply/countries-eligible-for-support/">http://www.gavialliance.org/support/apply/countries-eligible-for-support/</a>
DTP3 Coverage Rate	WHO/UNICEF Estimates of National Immunization Coverage. 2017 data as of 17 Jul 2018. Retrieved from: <a href="http://www.who.int/immunization/monitoring_surveillance/data/en/">http://www.who.int/immunization/monitoring_surveillance/data/en/</a>
Surviving Infants	United Nations Population Division. World Population Prospects (WPP): 2018 Revision. Retrieved from: <a href="http://esa.un.org/unpd/wpp/">http://esa.un.org/unpd/wpp/</a>
Projected Introduction Dates	This information comes from a variety of sources, primarily the most recent Gavi Strategic Demand Forecast and WHO regional projections. For more information, please contact Kirthini Muralidharan at <a href="mailto:kmurali2@jhu.edu">kmurali2@jhu.edu</a> .
Dates of Introduction	This information comes from a variety of sources, such as Gavi, WHO, UNICEF, ministries of health, the news media, and IVAC partners/contacts. For more information, please contact Kirthini Muralidharan at <a href="mailto:kmurali2@jhu.edu">kmurali2@jhu.edu</a> . It is cross-referenced with WHO information (below). World Health Organization. Immunization Repository. Includes data on introductions through the end of Jun 2018, as of Jul 2018.
Current Vaccine Use Status and Program Type	This information comes from a variety of sources, such as Gavi, WHO, UNICEF, ministries of health, news media, and IVAC partners/contacts. For more information, please contact Kirthini Muralidharan at <a href="mailto:kmurali2@jhu.edu">kmurali2@jhu.edu</a>

## SELECTED KEY TERMS

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For any definitions not provided below, please refer to the data dictionary in [VIEW-hub](#).

**Approved:** the application meets all the criteria and is approved for Gavi support.

**Approved with clarification:** the application lacks specific pieces of data, which must be provided generally within a month. Data must be received before the application is considered officially approved for Gavi support.

**Children with access:** the number of children (based on surviving infants 2015) who live in a country that has introduced the vaccine into the national immunization program. This does not include countries with widespread market use or high-risk programs. For regional introductions, those regions that have introduced may be included and the regions which have not introduced excluded.

**Children vaccinated:** the number of surviving infants who received the vaccination based on the 2016 coverage rates of countries who have introduced. The WHO/UNICEF estimates of national immunization coverage (WUENIC) coverage rates are used for this figure.

**Introduced into national immunization program:** the vaccine has been incorporated into the national government's immunization program, either for all children or for special populations at high-risk of disease, and it may include programs that are being phased in over time. This status can apply to any country, regardless of Gavi eligibility. For IPV, this status covers all countries that have introduced at least one dose of IPV into its child national immunization schedule.

**Subnational introductions:** the vaccine has been introduced into the vaccination schedule for a geographic subset of the country. This status can apply to any country, regardless of Gavi eligibility. Subnational introductions in this report refers to countries with phased national rollouts as well as countries that have introduced only on a subnational level (with no known plans of national scale up).

**Gavi application submitted under review:** the country has submitted a New and Underused Vaccines Support (NVS) application for this vaccine and is awaiting Gavi evaluation.

**Gavi approved/approved with clarification:** the country's application to Gavi for New and Underused Vaccines Support (NVS) financing for this vaccine has been approved or approved with clarifications.

**Gavi conditional approval to introduce:** the application to Gavi for New and Underused Vaccines Support (NVS) for this vaccine does not fulfill specific or significant application requirements. Missing requirements must be provided in a subsequent round to complement the original application. If the conditions are not met within the given timeframe after the first submission, re-submission of a new application is required.

**Gavi resubmission:** the New and Underused Vaccines Support (NVS) application for this vaccine is incomplete and a full application should be submitted in a future round.

**Gavi plan to apply:** country has made a public statement (through government or other recommending body on vaccines) that they plan to introduce the vaccine and apply for Gavi New and Underused Vaccines Support (NVS), but has not yet submitted an application.

**No decision:** the country has not indicated a firm decision to introduce the vaccine into its national immunization program or to apply for Gavi New and Underused Vaccines Support (NVS) for the vaccine.

**Non-Gavi planning introduction:** a country that is not eligible for Gavi support has plans to introduce the vaccine into its national immunization program and has taken steps to initiate its program, such as contacting the vaccine manufacturer.  
OR: A country that is eligible for Gavi support and plans to introduce without it.

**Planning introduction:** is the combination of countries that have announced plans to apply for Gavi support, Gavi countries that have announced plans to introduce the vaccine without Gavi support, or non-Gavi countries that have announced a plan to introduce.

**Risk:** program for this vaccine only covers children in special populations at high-risk for disease; this may include children with health conditions, those of vulnerable socioeconomic statuses or ethnic groups, or those living in regions of high risk.

**Widespread coverage through private market:** most (over half) of the target population is receiving the vaccine through private market use.

## APPENDIX

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VIEW-hub is a new, interactive data visualization tool, which has replaced IVAC's previous Vaccine Information Management System (VIMS) - developed in 2008. VIMS was a web-based database with key information related to the vaccine introduction, which provided data for the quarterly VIMS Global Vaccine Introduction reports. VIEW-hub has retained important data elements (such as vaccine introduction information) previously found in VIMS, but has expanded both in scope and functionality to better meet the evolving needs of global vaccine stakeholders and decision makers.

Since the launch of VIEW-hub in 2016, the VIMS Global Vaccine Introduction reports developed by IVAC each quarter will now be known as the VIEW-hub reports. The data are continuously updated as information is received, so as to permit real-time reporting.

VIEW-hub was made possible with support from Gavi, The Vaccine Alliance, the Bill & Melinda Gates Foundation and the ROTA Council.

### Use of VIEW-hub:

Through VIEW-hub, users can instantly visualize data on vaccine introductions, product usage, dosing schedules, access, coverage, impact studies, and more for a number of vaccines. Custom queries and maps, exportable data and graphics, and a map gallery are just some of the interactive features users can access. VIEW-hub extends the functionality and content of the former VIMS, allowing users to track progress and strategize ways to accelerate and optimize vaccine implementation.

Any data on projected introduction dates should not be reproduced or disseminated without prior consent from VIEW-hub personnel.

If data are used in a presentation, please cite VIEW-hub accordingly:

Source: International Vaccine Access Center (IVAC), Johns Hopkins Bloomberg School of Public Health. VIEW-hub Global Vaccine Introduction Report, December 2018. [www.jhsph.edu/ivac/view-hub](http://www.jhsph.edu/ivac/view-hub). Accessed: [Day Month Year].

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