Indicator description	Number of lives saved by immunising children against killer diseases
Indicator type	Output (children immunised) and outcome (lives saved)
Rationale	The government has a manifesto commitment to "*By 2020…save 1.4 million children's lives by immunising 76 million children against killer diseases.*"
Technical definition	The number of children immunised through Gavi support, by country. This information is then used as an input into a linear, deterministic model, to estimate the number of lives saved. These results are then attributed to DFID, based on DFID's share of total funding provided to Gavi.
Data calculations	**Number of unique children immunised** This is calculated for each individual country for each relevant year, and then aggregated across all Gavi-supported countries to estimate the total number of unique children immunised. The calculations follow 3 steps: 1. The Gavi-supported vaccine delivered through the routine system with the highest level of coverage at national level is selected. 2. The estimate of coverage is multiplied by the number of surviving infants in that year for that country. 3. This is aggregated across all Gavi-supported countries for each year in the relevant period (2015 – 2020). <u>Note</u>: Routine vaccinations are distinct from those delivered via campaign. Vaccine campaigns are one-off programmes aimed at vaccinating a large number of people in a short amount of time. This is principally to either i) prevent or stem disease outbreaks or ii) to initiate a catch-up in coverage. Routine vaccinations are administered principally to children on an ongoing, systematic basis. **Number of lives saved** The number of lives saved by Gavi-supported vaccinations are estimated using publicly available, peer-reviewed models. The principal methods are described in detail in Lee et al. (2013), although the exact approach has been refined and updated for Gavi's use. An overview is provided below. The number of lives saved is estimated for 10 antigens across 73 Gavi-supported countries. The

	impact of each vaccine is estimated at the country level, based on the number of persons vaccinated. Lives saved are calculated as the difference in deaths expected to occur over the lifetime of vaccinated cohorts compared to the number of deaths expected to occur in these cohorts without vaccination. The total number of lives saved by Gavi-supported vaccinations between 2015 and 2020 is therefore the total lives saved by each vaccine supported by Gavi in each country over the relevant period. There are three key differences between the methods applied in Lee et al., and those used by Gavi for their results: 1. **Timeframe:** Lee et al. assesses vaccination impacts over a 10 year period (2011 – 2020), while Gavi results are considered in the context of the second 5 year replenishment period (2016 – 2020). 2. **Vaccination support:** Lee et al. estimate the total impact of vaccination against a hypothetical scenario in which no vaccination occurs; this is irrespective of whether vaccines were already in country programmes, and whether Gavi provided support. Gavi results consider only the vaccinations that Gavi supports, assessing the incremental impact of these vaccinations. Consequently in comparison to Lee et al., Gavi results do not include the impacts from Measles 1st dose, but do include routine Rubella vaccinations. 3. **Data sources:** The most recent available data sources were used by Lee et al., but these have since been updated. The most recent data and models available are used by Gavi to estimate their results. <u>Gavi-supported vaccinations</u> Gavi includes both direct and catalytic impact in its results. **Direct financing** relates to when Gavi provides direct financial support for a vaccine. **Catalytic support** relates to situations where a country does not receive direct support from Gavi because it has graduated or transitioned from it, but Gavi's support is deemed to have a catalytic impact. Examples of this include: countries that introduced vaccines with Gavi support and continue to finance

	routine delivery after they have graduated or transitioned to fully self-financing vaccines; countries that finance routine delivery of a vaccine independently after Gavi finances the launch of the vaccine in the country through a catch-up campaign; and countries that have graduated or transitioned to fully self-financing vaccines which have access to prices obtained with Gavi support. The impact of catalytic support is quantified for five years after a country has graduated or transitions to fully self-financing vaccines. Graduation and Transition from Gavi support Prior to 2015, once countries reached a certain level of GDP per capita they were no longer eligible to apply for support from Gavi for new vaccines. Gavi would honour existing multi-year commitments it had in these countries, but following their conclusion no further support would be provided. This graduation policy is detailed at: http://www.gavi.org/about/governance/programme-policies/graduation/. Examples of countries that graduated under these arrangements include Albania and Bosnia & Herzegovina. Catalytic impacts include vaccines that were introduced with Gavi support in these countries and continue to be financed with domestic resources following graduation. From July 2015, Gavi introduced a new transition policy: http://www.gavi.org/support/apply/graduating-countries/. This puts a greater focus on ensuring the financial sustainability of vaccine programmes in-country. During the transition process, countries gradually increase their co-financing contributions until they are fully self-financing vaccines; once they reach this point, they are included in the impact of catalytic support for a further five years. Honduras is an example of a country that transitioned to fully self-financing vaccines in 2016. Gavi Vaccine Prices Due to the number of doses of vaccines that Gavi procures, it can shape vaccine markets to secure lower prices than would otherwise be available to many of countries eligible for Gavi support. For example, Gavi has secured price reductions which have brought the total cost of immunising a child with pentavalent, pneumococcal and rotavirus vaccines down from $37 in 2010 to $20 in 2015. Access to

	these lower prices is a critical part of Gavi support, and countries that have transitioned to fully self-financing vaccines have access to these prices for a further five years. Note: Gavi refers to future deaths averted and not lives saved, but this terminology is taken as interchangeable for the purposes of this calculation. For both the number of unique children immunised and the number of lives saved, the total Gavi estimates are multiplied by DFID's attributed share of Gavi's core funding (currently 25.9%), to estimate the volume of results attributable to DFID funding. These attributed estimates are used to report against our public immunisation and lives saved commitments.
Data sources	**Number of unique children immunised** • Gavi has an internal database of the vaccines provided by country and year. These can be seen by country on the Gavi Country Hub. • Coverage estimates by vaccine and country are provided by the WHO/UNICEF Estimates of National Immunisation Coverage (WUENIC). • Number of surviving infants by country are estimated through the UN World Population Prospects (WPP) dataset. **Number of lives saved** The principal methods are described in: Lee, LA et al. (2013). The estimated mortality impact of vaccinations forecast to be administered during 2011 – 2020 in 73 countries supported by the Gavi Alliance. *Vaccine,* 31S: B61-B72. Available here. For the purposes of Gavi results, the approach in this paper has been refined as described in '*Data calculations*'.
Reporting roles	Gavi reports on these outputs, using data from the sources outlined above. As described in the '*Data calculations*' section, we then calculate DFID's share of these results, based on DFID funding to Gavi.
Worked example	**Number of unique children immunised in Uganda by Gavi support in 2014** • Gavi supported two vaccinations in Uganda in 2014: Pentavalent and Pneumococcal. • Pentavalent had the highest coverage rate at 78%. (***1***) • No. of births in Uganda (2010 – 2015):

	7,882,000. (***2***) • Estimate of births in Uganda in 2014 (assume constant no. of births every year): (***2***) / 5 = 1,576,400. (***3***) • Surviving no. of infants at age 1 per 100,000 (2010 – 2015): 93,880 = 93.88%. (***4***) • No. of surviving infants in Uganda in 2014: (***3***)*(***4***) = 1,479,924. (***5***) • No. unique children immunised by Gavi support in Uganda in 2014: (***1***)*(***5***) = 1,154,341. (***6***) • DFID attributed share of total funding provided to Gavi in 2014: 29% (***7***) • DFID attributed share of unique children immunised in Uganda in 2014: (***6***)*(***7***) = **334,759** **Number of lives saved:** It is not possible to provide a fully worked example of the number of lives saved attributed to DFID support due to the complexity of the models involved. However an illustrative example of DFID's contribution to Gavi's estimated impact on lives saved is provided below: • Cumulative lives saved by Gavi support between 2011 and 2014: 3.1m (***1***) • DFID attributed share in 2014: 29% (***2***) • DFID attributed share of cumulative lives saved by Gavi support between 2011 and 2014: (***1***)* (***2***) = **0.899m** Note: the DFID attributed share of lives saved in 2014 is different to the projected attributed share up to 2020 as this relates to a different funding period.
Baseline data	Baseline data is not applicable in this instance as the targets are all additional over the period considered. However, to give a sense of scale, between 2010 and 2014 the UK immunised 67.1 million children through its support to Gavi, compared to the commitment to immunise 76 million children between 2015 and 2020.
Return format	Number of unique children immunised; number of lives saved through vaccination.
Data dis-aggregation	None.
Data availability	Annually
Time period/lag	1 year (results for a given calendar year will typically be reported in September of the following year)
Quality assurance	WUENIC and WPP are independent from Gavi and

measures	are well-respected sources of data. The models used to generate the numbers of lives saved are peer-reviewed and updated and refined as new data becomes available. Since Lee et al. was published, four additional vaccine models covering six antigens have been included in the modelling to support Gavi's results; a further three models will be included during the next round of modelling. This will bring the total number of models used to fourteen, involving nine separate institutions.
Interpretation of results	Results reported are cumulative, over the 2015 – 2020 period. Earlier years of data may be subject to small revision in future years – see *'Data quality'* box for more information.
Data quality	WUENIC is updated every year and WPP every three years. WUENIC and WPP data is retrospectively updated for all years tracked with each release, so previous years' estimates are subject to revision.
Data issues	The modelled estimates of lives saved are necessarily uncertain; they are dependent on a range of parameters and the estimates for each vaccine may be based on studies undertaken in particular countries or regions. There is no uniform approach to modelling uncertainty, but upcoming iterations are looking to use range estimates of lives saved alongside point estimates.
Additional comments	DFID's attributed share of Gavi's core funding may change over the reporting period if additional donors contribute to Gavi or existing donors increase their contributions. This could retrospectively reduce DFID's attributed share of Gavi's results (DFID's burden share is capped at 26%, so it will not increase above this level).
Variations from standard methodology	None.