

This Beremans Ltd report provides a robustly independent and realistic assessment of the market for dengue vaccines. We emphasise that we are not linked to, or affiliated with, or influenced by, or in any way beholden to any organisation with any interest in promoting dengue vaccines, whether from a commercial perspective, or from a charitable / aid work perspective, or from a public health or any other perspective. There were no conflicts of interest which could have affected our findings or the presentation of our findings.

We first assessed and summarised the state of knowledge regarding dengue disease transmission and pathophysiology, by reference to peer-reviewed publications. We then collected publicly available data on reported dengue cases worldwide, and used this to produce a picture of the increased global incidence from 2004-2008, and to derive an estimate of actual cases worldwide. These data also permitted us to identify countries where dengue transmission has been reported, and to categorise countries on the basis of known endemicity, possible endemicity or risk of endemicity. The above allowed us to gain a clear idea of the clinical need associated with dengue.

We then reviewed the technical challenges and types of technical approach relevant to dengue vaccine development. This enabled us to provide background detail which is helpful in discussing the various different candidate dengue vaccines that have reached the clinic. Similarly, we examined broad features of the dengue vaccine market, particularly in terms of significant stakeholders, and their influence on the procurement and pricing of some vaccines. This provides useful background to later chapters presenting detailed revenue projections.

Next, we identified the main candidate dengue vaccines, focussing on those in clinical development, and summarised the publicly disclosed clinical trials for each vaccine. We also identified the commercial interests in dengue vaccine development, and noted publicly disclosed licensing activity. In addition, we discussed the extent to which clinical trial information on the administration schedules of the different vaccine candidates suggests their applicability to different population segments (e.g. infants vs. travellers).

Importantly, we undertook a major exercise to quantify the different populations that might be appropriate for dengue immunisation, namely total populations, urban populations, surviving infant populations, and traveller populations. For traveller populations, this required construction of a detailed model using numerous manipulations, corrections and adjustments of raw travel data to provide defensible estimates of actual traveller numbers from each of 21 different developed countries to each of >100 countries where dengue transmission may occur. In our opinion, this is the most comprehensive and accurate model of international travel available. We also projected relevant population numbers to 2020, to provide a base for revenue projections.

We then identified key data which allowed us to make rational and defensible assumptions to apply to our model of dengue vaccine revenue projections. These assumptions (e.g. price, time of market entry, maximum market penetration, rate of market penetration, roll-out per country, etc.) are specified and justified in the text, and enabled an estimation of the market for (i) a private sector vaccine in the developed world (i.e. a travel vaccine); (ii) a private sector vaccine in the developing world; and (iii) a public sector vaccine in the developing world. Finally, we interviewed key experts in the field to obtain third-party views on aspects of the market for dengue vaccines.

The report is lengthy, but contains, in addition to the Executive Summary, an extended Summary at the end of each Section. The busy reader may identify all key points by reference to the Summaries, and supplement this as necessary by reference to the text in the main body of each Section. Additional background information is contained in the Appendices.