Supplementary Table 1: Framework to inform vaccine development

Themes Considered	Indicators	Very Low	Low	Moderate	High	Very High
Biological Feasibility	Most advanced vaccine candidate(s)	• Ph1, or preclinical, or no candidates in the pipeline	• Ph2 candidate	• Ph3 candidate	• Ph3 candidate with high likelihood of licensure by a WHO-listed national regulatory authority	• Licensed vaccine by a WHO-listed national regulatory authority
Biological Feasibility	Existence of immunity from natural exposure	• No evidence that natural exposure confers immunity	• Conflicting or minimum evidence	• Some evidence and/or immunity of limited duration	• Good evidence of relatively long-lasting immunity	• Well established that natural exposure confers protects against severe disease (or indicated vaccine outcome) with durable immunity
Biological Feasibility	Understanding mechanisms of immunity	• Mechanisms of pathogen induced immunity unknown	• Very limited or conflicted understanding of pathogen-induced immunity and/or immune-enhanced disease	• Some understanding of pathogen-induced immunity and whether immune-enhanced disease exists	• Good understanding of pathogen-induced immunity, however some mechanisms remain unclear; evidence that immune-enhanced disease is unlikely	• All mechanisms of pathogen-induced immunity are well understood; robust evidence that immune-enhanced disease is rare
Biological Feasibility	Likelihood of vaccine protection against the majority of pathogenic strains	• Evidence that a vaccine would not protect against majority of pathogenic strains, or gap in evidence of that a vaccine would protect against	• Limited evidence that a vaccine would protect against majority of pathogenic strains	• Some evidence that a vaccine would protect against majority of pathogenic strains	• Strong evidence that a vaccine would protect against majority of pathogenic strains	• No known strain variation that is relevant to a vaccine OR evidence that a vaccine will protect against all known strains OR new strain can be rapidly developed

		majority of pathogenic strains				
Product Development Feasibility	Existence of animal models to facilitate vaccine development	• Animal models do not exist and no progress has been made to identify them	• Animal models do not exist but some progress has been made to identify them	• Animal models are identified but their utility have not been confirmed	• Animal models are identified and used but the mechanisms of immunity are unclear	• Animal models are well defined and used and mechanisms of immunity are well understood OR animal models are not required for vaccine development
Product Development Feasibility	Existence of in vitro assays to facilitate vaccine development	• In vitro assays do not exist and no progress has been made to develop them	• In vitro assays do not exist but some progress has been made to develop them	• In vitro assays are developed but their utility has not been established or the assays have not been analytically qualified	• In vitro assays are analytically qualified and used but their fit for purpose as a relevant biomarker for decision-making or licensure has not been established	• In vitro assays are qualified/validate and are fit-for-purpose for decision-making or licensure

Product Development Feasibility	Ease of Clinical Development	• A complex trial design (no correlate) and a significant investment in clinical sites/infrastructure needed for testing a vaccine OR low disease incidence a significant impediment to efficacy trial feasibility	• A complex trial design needed (no correlate) that may require investment in clinical sites/infrastructure OR low disease incidence requires a large and/or long efficacy trial	• A standard trial design that may require investment in clinical sites/infrastructure	• Common trial design, potential correlate and a possibility to leverage existing trial infrastructure	• Common trial design, established correlate and a possibility to leverage existing trial infrastructure AND high disease incidence allows for an efficacy trial
Product Development Feasibility	Availability or need for human challenge models	• Human challenge models OR diagnostic tools are important for vaccine development but are not developed	• Human challenge models OR diagnostic tools are important for vaccine development and some progress has been made to develop them	• Human challenge models OR diagnostic tools are important for vaccine development, are developed but not used or their use is unclear	• Human challenge models OR diagnostic tools would facilitate vaccine development and are developed but their use is limited	• Human challenge models OR diagnostic tools are important for vaccine development, are developed and widely used and accepted, OR no human challenge model is required