

Case Study

# Defining the Best Endpoint

Identifying the most efficient way to generate  
clinical evidence given multiple uncertainties.



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**KerusCloud is a ground-breaking new clinical study design and analytics software platform which delivers smarter real-time studies for today's clinical research challenges.**

Using powerful cloud-based processing, **KerusCloud** can handle the diverse and complex data now collected routinely, to deliver advanced analytics which simplify the study planning and decision-making process.

With unique second-generation study simulation capabilities, **KerusCloud** provides exceptional support in developing robust evidence packages for drug approval.

## The Challenge

Respiratory Syncytial Virus (RSV) infection is a disease with high unmet medical need. It is the most common cause of bronchiolitis in infants <2yrs and patients with underlying conditions can develop serious complications.

A biopharmaceutical company developing inhaled formulations was designing a first-time-in-patient study with multiple sources of uncertainty. These included:

- + Planning multiple doses due to uncertainty about exposure in infants.
- + Primary endpoint to be derived based on viral load measured in nasal aspirate samples but sample collection must be minimized due to discomfort for infants.

With Exploristics' support, this developer could examine what optimal controllable design features are needed to maximize the chance of success in this vulnerable population.

**Evaluating and selecting best development strategy with KerusCloud:**



## Testimonial

“The simulations were beautiful. They exploited the full potential of a historical data set to inform the design of our study. Options were ruled in or out and critical elements identified. This allowed us to simplify, enhance and de-risk the study design.

Chief Medical Officer, **Small Biotech**, UK

## Best endpoint and patient subgroup selection with KerusCloud

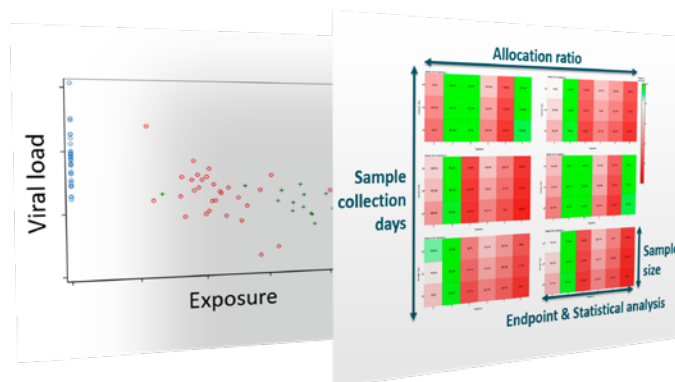
### The Approach

**KerusCloud** was used to develop and implement a study simulation framework. The information for simulations were derived from natural history data.

Scenarios were evaluated covering:

1. Number of dose groups
2. Size of each cohort
3. Ratio of active treatment to placebo in each cohort
4. Viral Load endpoint (AUC or slope)
5. Frequency of sampling

With **KerusCloud** it was possible to quantify the potential for a study to detect differential treatments in subgroups based on patient age or virus type and investigate analysis options such as exposure-response modelling. **KerusCloud** also simulated the differential efficacy based on virus type and PK exposure.



**Figure 1.** Differential efficacy based on viral type and PK exposure.

**Figure 2.** KerusCloud heatmap displaying the impact of 5 factors simultaneously.

### The Impact

**KerusCloud** established the appropriate sample-size, number of dose-groups and allocation ratios required. Its simulation results identified key factors for study success:

- + Quantifying the minimum number of nasal aspirate samples and best choice of endpoint and statistical analysis.
- + Confirming that the exposure-response modelling was viable.

Overall, this approach reduced the duration of the study by one year.





Discover the power of cloud-based simulation.

## Generate Robust Evidence

Develop strong evidence packages to support regulatory engagement or investment, increasing the value of development pipelines.

## Optimise Studies for Success

Identify the right development path, optimising the number of patients required to generate the evidence needed to reduce approval timelines, costs and the risk of failure.

## Accelerate Development

Accelerate access to novel treatments through better targeting of patient population and selection of outcome measures.

## De-Risk Investment

Rapidly evaluate and test the impact of key assumptions to de-risk investment.

## Transform Study Planning

**KerusCloud** transforms study planning with quick and convenient optimisation of study parameters to support the design of complex clinical research trials so you can:

- + Simulate data with correlations and missing values reflecting real-world patients and studies
- + Assess the probability of success for real-world objectives involving tradeoffs between several factors
- + Identify the critical study aspects impacting on the probability of success
- + Compare analysis plans with selections from the comprehensive analysis suite

