Geographical Spread

- The most common originating source for measles virus in Iceland in the 20th Century was Scandinavia, particularly Norway and to a lesser extent Denmark.
- Other sources include the Faeroes (as a stepping stone), Grimsby in the UK and once from the USA.
- In most instances, measles was imported into the Capital Reykjavik and then spread from there.
- There were some other entry points on the coast around Iceland.
- Common pathways that measles followed during epidemics included spreading from Reykjavik to a number of other cities, such as Ísafjörður.
- Once measles was present in Reykjavik, it appeared to always spread to everywhere else on the island.
- If measles was not present in Reykjavik, it didn’t spread across the whole island.

Epidemic of November 1946 (month 1) - June 1947 (month 8)

- Reykjavik infected in month 1.
- By month 2, spread to major provincial centres in the North and East.
- Month 3 - modest spread out of Reykjavik to neighbouring health areas.
- Month 4 - starts to appears in the Northwest Fjords.
- From then on, more and more health districts become infected.
- Took an average of 1.5 months for Reykjavik to become infected after the introduction of measles.
- Then spreads to other health districts in the Southwest of the island within an average of 4 moths.
- Spreads to the Northwest Fjords as the last major area after approx. 6 months.

Epidemic Velocity
Clinically, poliomyelitis occurs in three main types: abortive, non-paralytic; paralytic

Evidence of poliomyelitis in Ancient Egypt and in Medieval times - throughout much of history, poliomyelitis seemed to be a low-level, sporadic disease not occurring in epidemics

In the late 19th century, poliomyelitis began to occur in epidemics of increasing magnitude

First epidemics that can be identified occurred in the period between 1880 and 1890, primarily in Northern Europe, but also in some instances in Southern Europe such as Italy

Between 1890-1900 it occurred in the US and Australia

Poliomyelitis in Malta

By the first decade of the 20th century, can be seen elsewhere in the world (e.g. South Africa)

Series of virgin soil epidemics occurring in the world population, e.g. in Malta, Europe

In the 1920s/30s, just a handful of cases of paralytic poliomyelitis occurred (3/4 per year) - low-level disease activity

1942 - sudden switch to a major epidemic, 450 cases of paralytic poliomyelitis (3% of children under the age of 3 years)

Subsequent epidemics of varying magnitude in following years, eventually tailing off in the mid-1960s as a result of vaccinations

Poliomyelitis brought to an end by 1970

The 1942 epidemic was island-wide, stretching even to the neighbouring island of Gozo

Why, almost overnight in 1942, did poliomyelitis transition from a low level sporadic infection to an epidemic infection?

Military personnel coming from Egypt, where poliomyelitis was circulating, introduced a strain of the virus to which the people of Malta had no immunity - effectively a virgin soil epidemic (though not a strict definition)

The Common Cold in Tristan da Cuhna

Tristan da Cuhna in the South Atlantic is particularly interesting example of a virgin soil epidemic:

In the 1960s, it became the site of an investigation into the common cold by the Medical Research Council of the United Kingdom's Common Cold Unit, based in Salisbury in Wiltshire, using the island as a laboratory

The common cold is caused by a group of viruses called rhinoviruses - of which there are many types, with new ones emerging all the time

Therefore, the common cold is a cyclically re-emerging disease, each new virus associated with a virgin soil epidemic

Clearly defined, discrete epidemic waves of the common cold, separated by periods of no cases of the disease - the population was about 200-250 people at the time, simply not large enough to maintain the common cold in endemic form

Caused by repeated reintroduction of the common cold (each with a new strain) by ships, mostly from Cape Town

Each new strain was associated with approximately 40-100 cases, a 20-50% attack rate

Typically, each individual from Tristan da Cuhna experienced less than 1 episode of the common cold on average per year - less than is usual on the continent, reflecting the isolation of the island