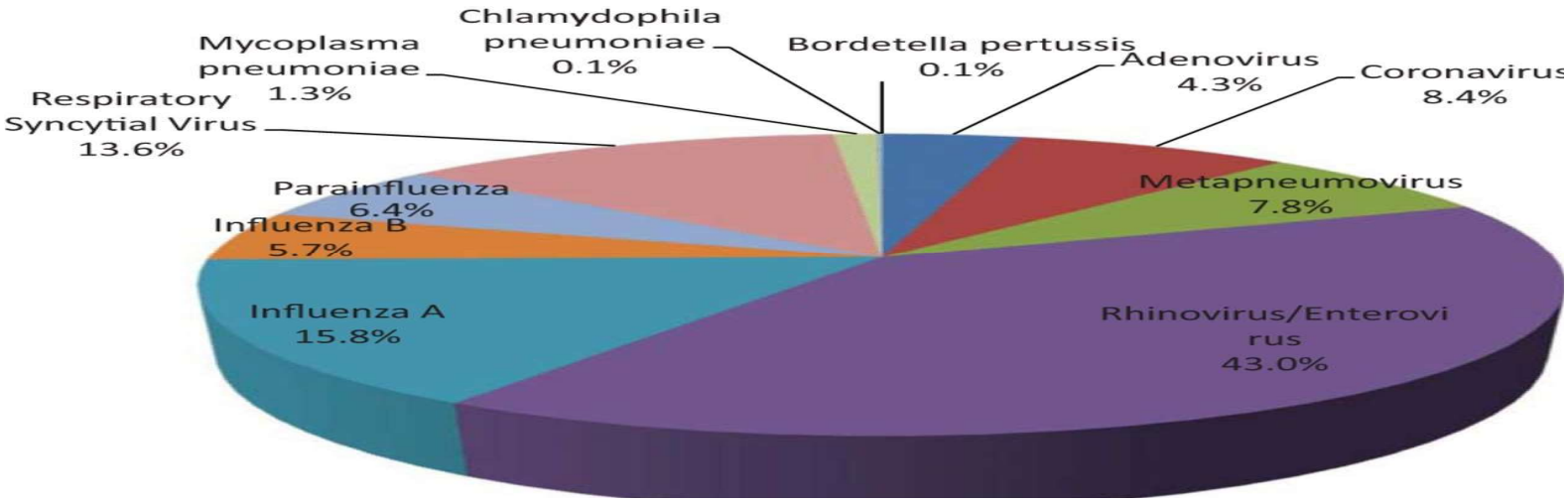
RESEARCH REPORT



SYNDROMIC MULTIPLEX PANELS MARKETS.

Strategies and Trends. Forecasts by Syndrome (Respiratory, Sepsis, GI etc.) by Place and by Product. With Market Analysis, Executive Guides and Customization. 2022 to 2026

HOWE SOUND RESEARCH

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Howe Sound Research is a market research and consulting company based in Vancouver, British Columbia, Canada. In our spare time we like to sail in a large body of water nearby called Howe Sound. We publish market research reports that address scientific industries with an emphasis on Biotechnology and Clinical Diagnostic markets. We consider ourselves experts in these areas.

We approach market research differently than other companies. At any one time we have a limited number of reports, and we update them frequently, sometimes several times a year. Our reports are prepared by people who understand the industry and have worked and studied in the area. This contrasts with the many research mills who produce canned reports on the Handbag market one day and the XRay market the next.

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2.1 What are Syndromic Multiplex Tests?

Syndromic Multiplex tests identify many infectious diseases with a single test.

Syndromic Multiplex Tests (SMT) are single tests that report back on the presence, or not, of several infectious diseases at the same time. Today the pattern is for a doctor, when faced with a patient who has some kind of cold/flu for instance, (a respiratory syndrome) to make a preliminary diagnosis and then to order a limited number, or just one, test to see if the diagnosis is correct. This is the traditional approach that goes back to the days when not all infectious diseases were known and they were recognized instead by their symptoms. The laboratory was used to confirm, or not, the diagnosis and often the disease was treated, and still is today, before the laboratory results were in. Tests were considered to be expensive and were ordered only as needed and often not at all.

These tests are DNA based and consequently are more accurate and specific.

The revolution in genetic knowledge has created technologies that can recognize multiple pathogens using a single test. This is called a multiplex test. The technology is DNA based so these tests tend to be very much more accurate than traditional testing methods. And because of this DNA base the possibility exists of identifying specific classes of pathogens, e.g. those resistant to certain antibiotics or susceptible to other antibiotics.

A syndrome is a group of symptoms that are often seen together and suggest the presence of one or more infectious diseases. The GI-Enteric Syndrome for instance, might often just be referred to by its main symptom, diarrhea. So diagnostic tests are being developed that test for a wide range of pathogens, in a single test, that might cause this symptom. This Syndromic Multiplex testing approach costs more initially, sometimes a lot more, but despite that is proving very popular.

Suppliers are providing different tests for different syndromes with different pathogens identified. These can be performed on smaller proprietary instruments and sometimes on traditional laboratory instruments. This has created a complicated dynamic market with new tests and new instruments being frequently announced.

3.1.2 Middle East respiratory syndrome (MERS)

In September 2012, a new type of coronavirus was identified, initially called Novel Coronavirus 2012, and now officially named Middle East respiratory syndrome coronavirus (MERS-CoV). WHO issued a global alert soon after. The WHO update on 28 September 2012 stated that the virus did not seem to pass easily from person to person. However, on 12 May 2013, a case of human-to-human transmission in France was confirmed by the French Ministry of Social Affairs and Health. In addition, cases of human-to-human transmission were reported by the Ministry of Health in Tunisia. Two confirmed cases involved people who seemed to have caught the disease from their late father, who became ill after a visit to Qatar and Saudi Arabia. Despite this, it appears that the virus had trouble spreading from human to human, as most individuals who are infected do not transmit the virus. By 30 October 2013, there were 124 cases and 52 deaths in Saudi Arabia.

After the Dutch Erasmus Medical Centre sequenced the virus, the virus was given a new name, Human Coronavirus–Erasmus Medical Centre (HCoV-EMC). The final name for the virus is Middle East respiratory syndrome coronavirus (MERS-CoV). In May 2014, the only two United States cases of MERS-CoV infection were recorded, both occurring in healthcare workers who worked in Saudi Arabia and then traveled to the U.S. One was treated in Indiana and one in Florida. Both of these individuals were hospitalized temporarily and then discharged.

In May 2015, an outbreak of MERS-CoV occurred in the Republic of Korea, when a man who had traveled to the Middle East, visited 4 hospitals in the Seoul area to treat his illness. This caused one of the largest outbreaks of MERS-CoV outside the Middle East. As of December 2019, 2,468 cases of MERS-CoV infection had been confirmed by laboratory tests, 851 of which were fatal, a mortality rate of approximately 34.5%.

5.4.2 Comparing Syndrome and Targeted Testing

Syndromic testing, and its popularity, represent a shift in thinking about diagnosis. Traditionally diagnosis is done by a doctor with the lab tests confirming (or not) the diagnosis. In the syndromic testing paradigm, *the diagnosis shifts to the lab*. The doctor, recognizing the limits of their craft, lets the lab do the real work, and often saves physician time in the process. It is no wonder that time pressed Emergency Room physicians are enthusiastic adopters. Working against this is a very traditional view, control costs by stopping physicians from ordering unnecessary and expensive tests. This narrow view ignores the broader cost picture and the goal of the medical system, better care.

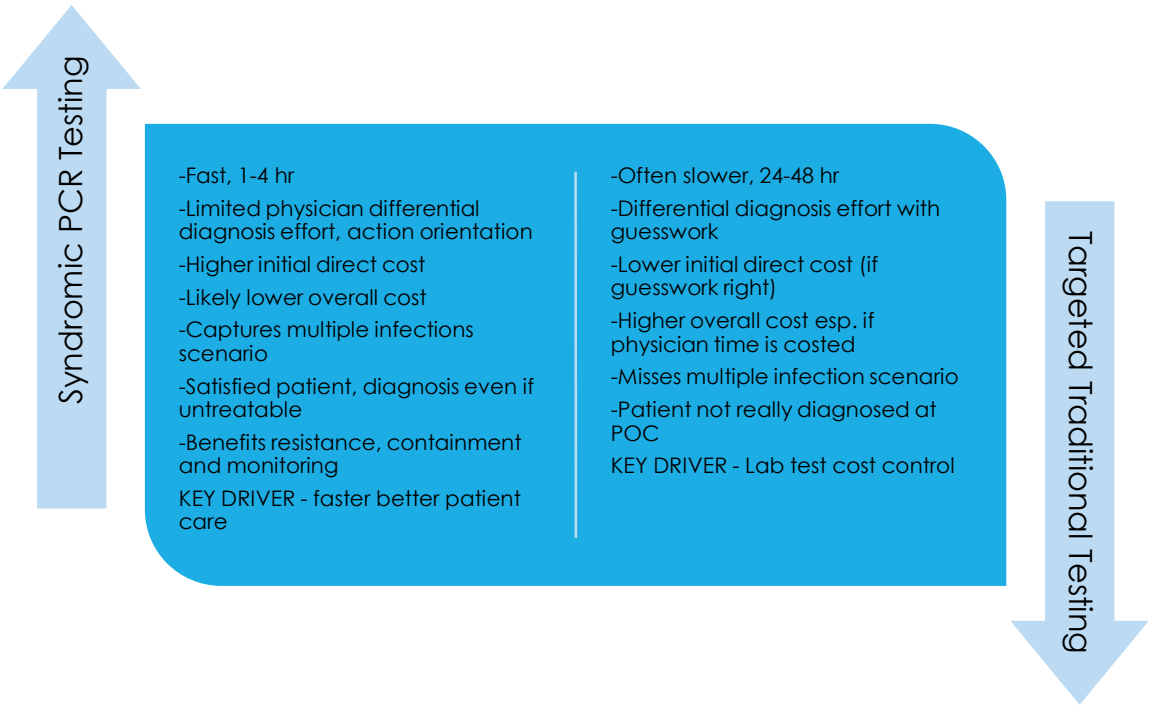

FIGURE 14 COMPARING SYNDROMIC AND TARGETED TESTING

6.1 Recent Developments – Importance and How to Use This Section

6.1.1 Importance of These Developments

Many users, especially those in the financial community, have noted that this section of the report can be extremely valuable in helping to understand industry current events and the evolution of key market players. These items are not chosen at random. They have been selected by the authour(s) as significant and worth reading about, i.e. important. Please keep this in mind in reviewing them.

6.1.2 How to Use This Section

These items are NOT in date order. They are in the order in which they have been added to the report. This report is updated regularly, and new items are incorporated, and others removed. Please refer to the date of an item to understand its currency. Reading this entire section is recommended for those not familiar with the industry. Many of the trends and issues noted elsewhere are illustrated in these actual events.

6.2 Genetic Signatures Wins Public Health Wales Contract

Mar 30, 2022

Australian infectious disease molecular diagnostics developer Genetic Signatures said on Wednesday that it has won a tender for a three-year contract with Public Health Wales to provide molecular detection of enteric pathogens. Under the contract, worth up to $1.8 million (US$1.4 million) per year, Genetic Signatures will provide its EasyScreen enteric real-time PCR testing kits and instruments to seven sites within Wales.

EasyScreen enteric qPCR is a CE-marked flexible syndromic test that can detect more than 20 clinically relevant pathogenic bacteria, protozoan, and viral agents that cause gastroenteritis symptoms, the firm said in a statement.

The assay uses Genetic Signatures' proprietary 3base technology, which employs bisulfite treatment to reduce complexity between subtypes or strains without compromising specificity.

Genetic Signatures recently joined the BioHub Birmingham as the launchpad for a planned further expansion into Europe, the Middle East, and Africa.

7.9 Aus Diagnostics

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Description:

Revenue: ~$7.5M

This privately held company was founded in 2006 by the current Managing Director. The company offers a wide range of syndromic multiplexing kits using a distributor strategy with offices in the UK and New Zealand. The company is active in a wide range of markets beyond human medical syndromic multiples testing, including veterinary and environmental assay markets.

The company offers a robust kit product line with several panel options in each of the following Syndrome categories

Respiratory w C19 dx

GI Enteric

Sexually Transmitted Disease

Parasites

Bacterial Resistance

HPV

8.3.2 Chart – Global Market by Place – Base/Final Year Comparison

Revenues are base year US$ millions and do NOT include inflation.

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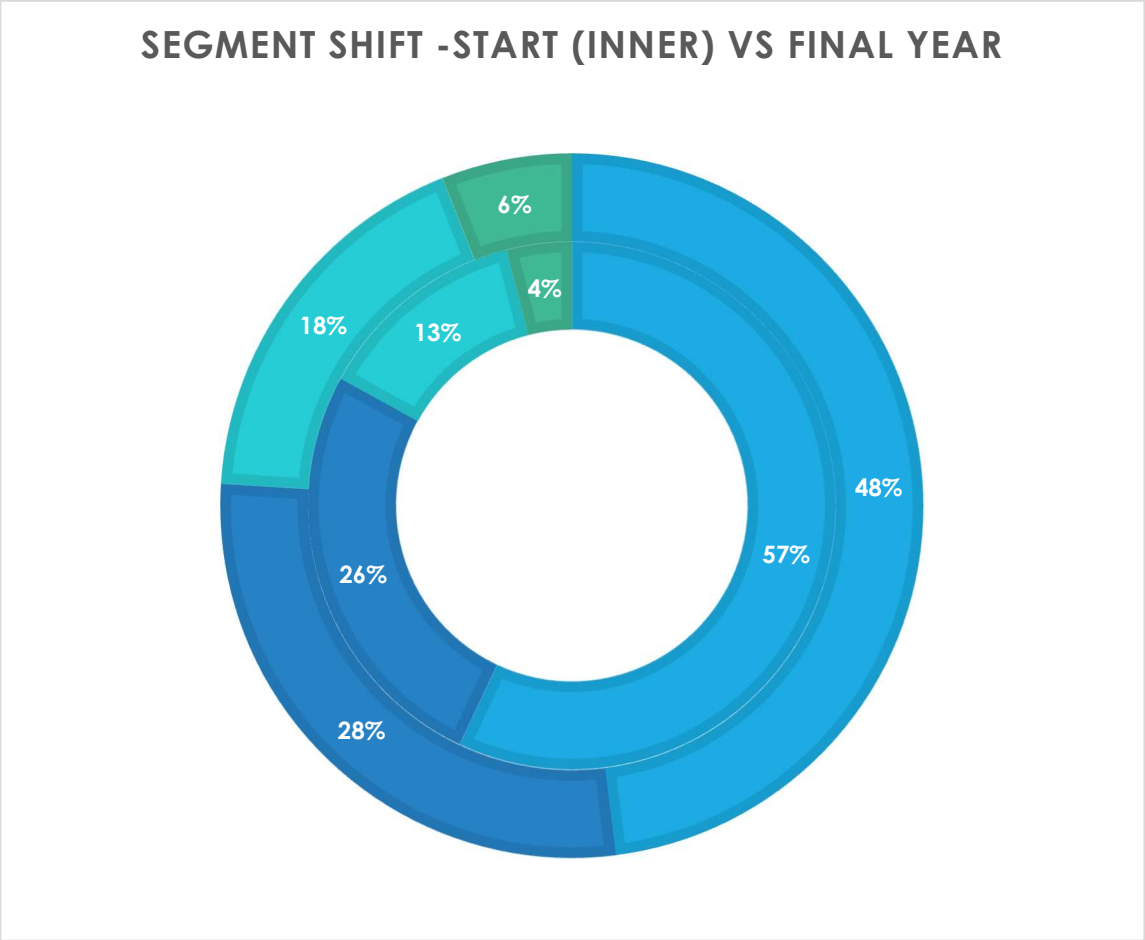

FIGURE 22 GLOBAL MARKET BY PLACE - BASE VS. FINAL

9.1 Respiratory

9.1.1 Table Respiratory – by Country

Revenues are base year US$ millions and do NOT include inflation.

TABLE 33 RESPIRATORY BY COUNTRY

	2021	2022	2023	2024	2025	2026	CAGR
USA	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
Canada	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
Germany	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
France	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
UK	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
RoEUR	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
Japan	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
China	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
S Korea	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
RoAP	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
Brazil	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
Mexico	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
RoLA	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
ME&A	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
Global	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx