Integrating data. Enhancing decisions. Improving lives.

How cloud-based analytics
is transforming health care

sas Microsoft

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Diagnosing the health care **challenge**

Dedicated health care professionals are always looking to improve patient outcomes and quality of life. Some of their key priorities include expanding access to care, enhancing safety for patients and staff, and offering preventive health care.

But for many medical professionals and clinical researchers, there are significant obstacles to navigate – from continued backlogs and resource constraints to staff shortages and pressure to develop new vaccines.

Underpinning this complex picture is a further challenge for health care organisations: **how to efficiently derive value from growing data volumes.**

The pandemic has accelerated digital transformation not just in health care, but across all sectors. As a result, the volume of data that organisations hold has dramatically increased. And while there is huge potential to use this data to transform health care, there are barriers to overcome first.

These include:

Fragmentation
Patient data is often siloed, making it hard for clinicians to see the full picture and make the best decisions.

Compliance
Data owners must understand and adhere to regulations in order to protect sensitive health information.

Integration
Medical data comes in different formats (structured, unstructured, imagery) that are difficult to combine.

Skills
Analysing large data sets can be a complex task, and specialised skills are often required to draw out actionable insights.

By solving these data challenges, health care organisations could significantly enhance clinical and operational outcomes to transform patients' lives.

Insights: the pathway to a **healthier future**

Imagine if the right medical data was available to the right professionals, at the time they needed it most.

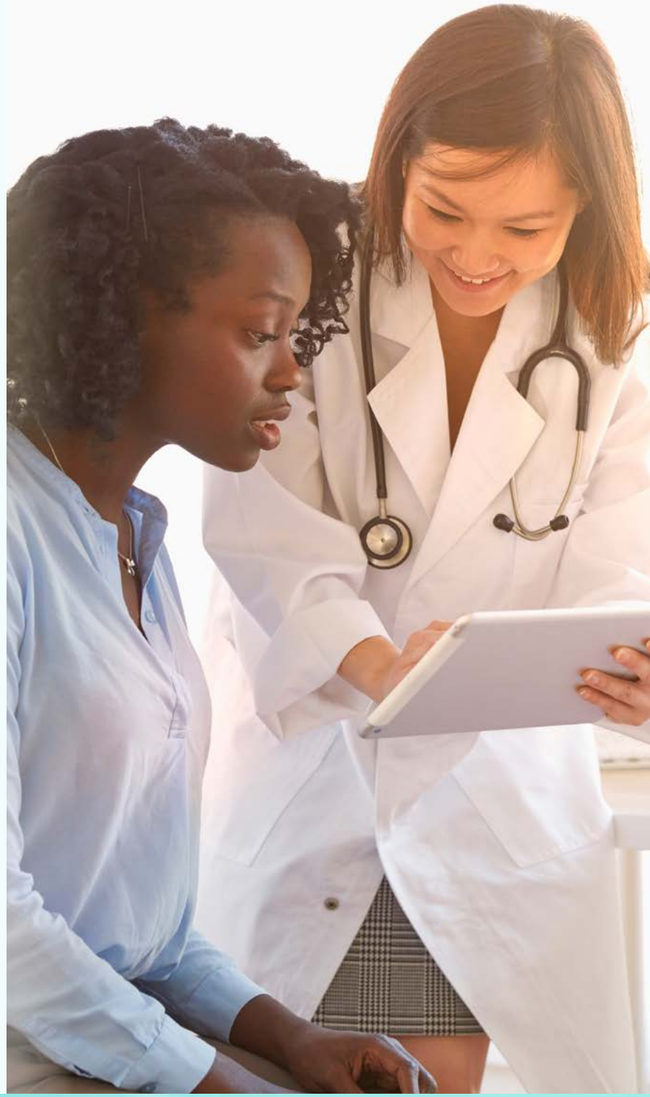
And imagine if that data wasn't just data, but instead took the form of meaningful insights, with the potential to inform clinical and operational decisions, accelerate research efforts, and ultimately improve lives.

The benefits of turning data into insights:

- Improved patient diagnoses.
- Tailored patient pathways.
- Accelerated clinical research.
- Faster therapeutic discovery.
- Disease prevention (short-term and chronic).
- Ability to connect social determinants with health.

Ultimately, better access to and analysis of health data would speed up the shift to precision medicine and value-based care.

Turning this vision into a reality is fully achievable thanks to advances in data analytics – and the benefits are already evident in health care settings today.



Cloud and analytics: **transforming** health care

A few pioneering organisations are already familiar with the concept of cloud and analytics. The two technologies go hand in hand, and are helping all sectors modernise their service delivery. In summary:

- **Cloud** provides data storage in a secure environment that is easily accessible and scalable.
- **Analytics** helps to connect, visualise, and analyse that data, generating actionable insights.

For health care, this combination means that you can connect the dots and make better-informed clinical and operational decisions – which can improve patient outcomes and save lives.

It also provides a foundation to interpret relevant data at scale using AI and machine learning, so that research teams can discover new health care breakthroughs faster.

Unlock the value

To unleash the potential of cloud and analytics within the health care sector, data connectivity and integration is a must.

We're on a mission to build a fully connected health care ecosystem in the cloud, with systems from different providers and research agencies all talking to each other. This would provide doctors with a wealth of resources to inform their diagnoses and treatment plans. It would allow policymakers to draw on more expansive datasets to predict future demand. And it would give researchers a bigger pool of data to support their life-changing work.

SAS and Microsoft are partnering to bring the best of cloud and analytics together – so health care providers can innovate to improve lives.

SAS and Microsoft: **partnering** today for a better tomorrow

Together, we're building a secure cloud environment for the sector, with access to analytic tools that unlock the full value of health care data.

Our robust technical integrations are making analytics easier to use by erasing traditional friction points between data, insights and action.

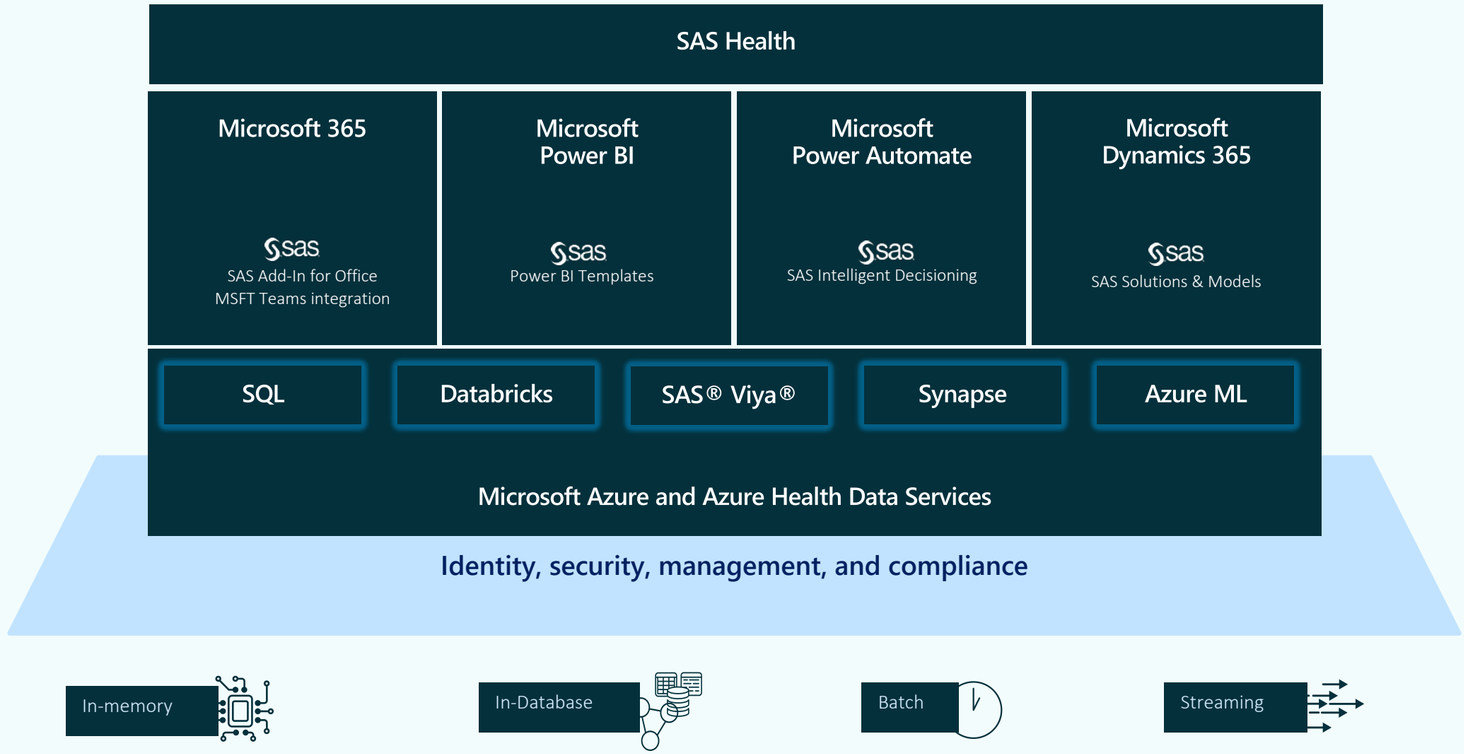
Here's what you need to know to get started:

Microsoft Azure Health Data Services is a Platform as a Service offering for Protected Health Information in the cloud that gives you the ability to connect multiple data sources quickly. Azure Health Data Services offer a combined, holistic view of structured, unstructured, and imaging data in real time. You can search and query data using Fast Healthcare Interoperability Resources (FHIR) to help you deploy services and connect them to the technology you need.

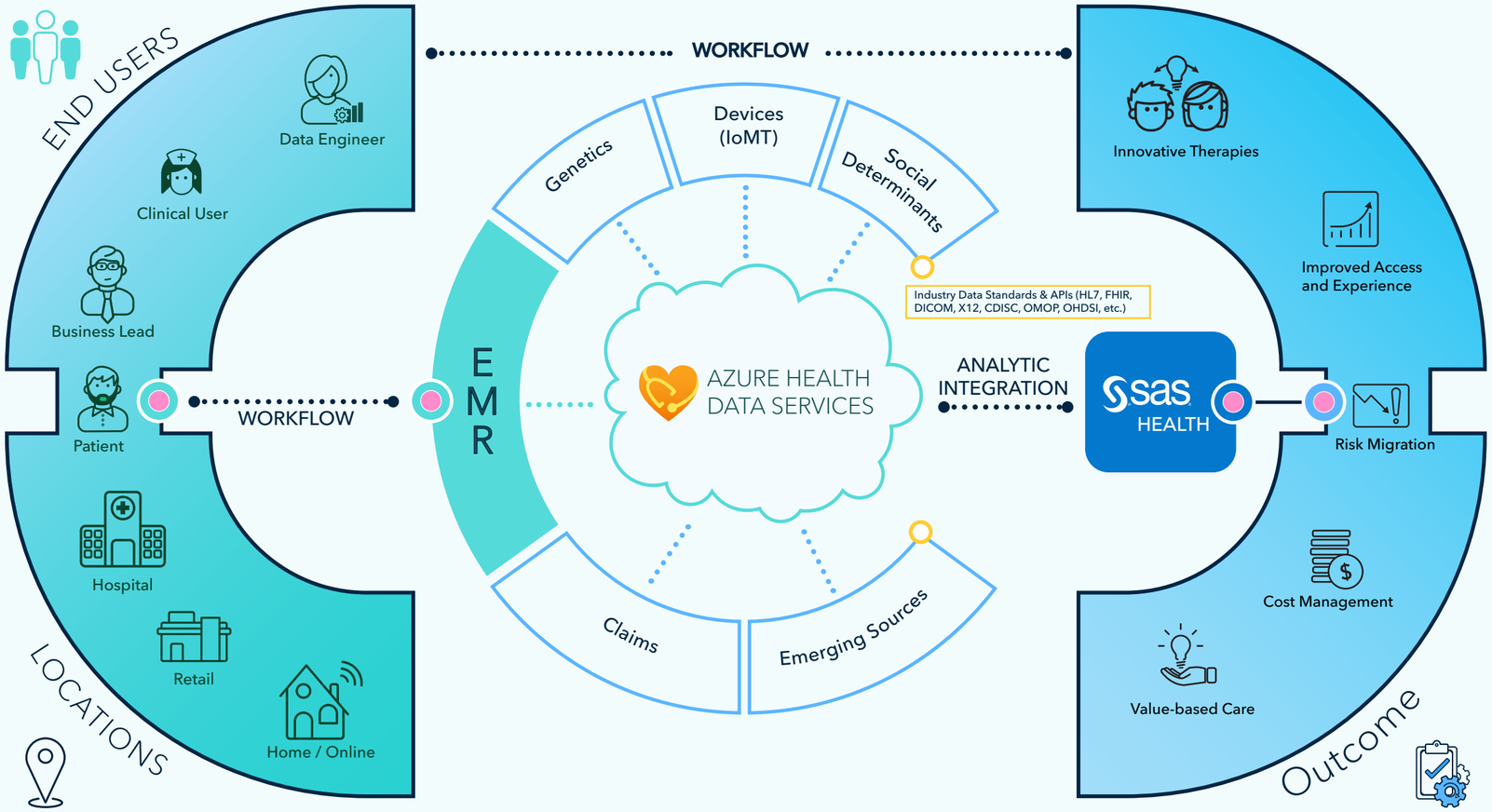
SAS Health offers tailored analytic solutions and flexible data science capabilities to meet the needs of both business users and data scientists. With SAS Health, you can simplify your data landscape and expand your analytical horizons. Integrate real world data, create patient cohorts, gain valuable insights on quality and cost of care, and enhance patient outcomes.

SAS and Microsoft: **partnering** today for a better tomorrow

Let’s break it down for you. Faster deployment means faster analytic insights. We remove operational barriers so you can act quickly to seize opportunities and mitigate risks.



SAS and Microsoft: **partnering** today for a better tomorrow



SAS Health powered by SAS Viya and Azure Health Data Services

The embedded-AI capabilities of SAS Viya and SAS Health running on Azure Health Data Services provide game-changing advantages across health care delivery and research.

By partnering with Microsoft and SAS, you can increase interoperability and flexibility within a secure cloud environment – unlocking the value of data and AI to improve health outcomes.

SAS Health on Azure can provide:

1. An accelerated, trusted research environment.
2. Clinical and operational decision support in a secure cloud environment.

By removing the complexity of accessing, sharing, and interpreting data, our capabilities give you the power to make better decisions.

Further benefits:

Access to analytic dashboards and insights for all stakeholders.

- Interoperability and flexibility within a secure cloud environment, unlocking the value of data and AI to improve health outcomes.
- Integration of health and non-health data for insights on health risks.
- Faster adoption of precision medicines and tailored health care solutions.
- Faster adoption of whole-person- and value-based care.

Analytics in action: transforming health care research in a **trusted** environment

Our SAS and Microsoft solution has already helped leading organisations to develop a trusted and efficient research environment.

According to the Irish Neonatal Health Alliance, pre-eclampsia – a condition that causes high blood pressure during pregnancy or the postpartum period[1] – leads to 76,000 maternal and 500,000 infant deaths each year.[2]

Patricia Maguire, Professor of Biomedical Science and Director of the Institute for Discovery at University College Dublin, explains: "Most of the diagnostics that were available to date in the clinic 'rule out' the disease.

In other words, clinicians could only find out that women don't have pre-eclampsia. In the last 60 or 70 years, there have been no breakthrough 'rule in' diagnostics at all."

This realisation spawned a research project which compared blood biomarkers between women with pre-eclampsia and healthy pregnant women.

Tons of data was collected, and University College Dublin researchers needed pioneering analytical techniques to make sense of this new information.

They partnered with SAS and Microsoft, using an AI-based cloud machine learning model to analyse the data, identify disease prevalence, and predict severity.

Today, the platform is used across the university and has helped bring hospital research projects to success. Maguire explains the importance of advanced analytics, machine learning and the cloud within the medical sphere, and shares her vision for the future.

"Access to machine learning and AI technologies for researchers, like myself, can be truly transformative for academic projects. We have seen that in our work on pre-eclampsia."

Prof. Patricia Maguire
Professor of Biomedical Science,
Director of the Institute for Discovery
University College Dublin

Analytics in action: improving clinical and operational decisions

SAS and Microsoft provide the technology and domain expertise you need to achieve your ambitious goals.

With a commitment to excellent patient care, running an intensive care unit (ICU) as efficient as possible is critical for ERASMUS University Medical Centre in the Netherlands. Medical teams used insights from SAS Viya on Azure to augment clinical decision-making to predict if discharging patient after surgery is safe, to have early warning systems in place in acute care settings, and to monitor the adherence to important clinical protocols.

1. Predicting Safe Discharge

An AI cloud-based machine learning model was built on SAS Viya on Azure (including SAS Visual Analytics and SAS Visual Machine Learning). The model will be used to predict if discharging patients after surgery, including a recovery outside the hospital, is safe.
This can improve the allocation of hospital resources. Data and model governance ensures predications are reliable.

Erasmus MC
University Medical Center Rotterdam

2. Quality Monitoring and Adherence to Clinical Protocols

The second use case aimed to monitor the quality and adherence to clinical protocols. Models for protocols around intercranial pressure, medical ventilation, and circulation were created.
All three models were built and visualised with the help of SAS Viya (including SAS Intelligent Decisioning and SAS Visual Analytics) on Microsoft Azure.

The first results showed improvements in quality monitoring and adherence to clinical protocols, and this informed clinical decisions and improved patient outcomes.

3. Early Warning System in Acute Care

The third use case aimed to monitor the quality and adherence to clinical escalation protocols to identify and respond quickly to patients deteriorating in clinical wards. With the help of SAS Viya on Microsoft Azure (including Visual Analytics and SAS Text Analytics) medical teams were able to monitor the adherence to clinical escalation protocols and improve the quality of care by using text analytics to discover hidden insights and warning signals.

Analytics in action: maintain COVID-19 vaccine integrity during the pandemic

The North Carolina Collaboratory relies on SAS Analytics for IoT on Azure to harness the complex system of cold chain logistics, ensuring safe transportation, storage and availability of COVID-19 vaccines across the state.

Safe transportation and storage of vaccines in low-temperature-controlled supply chains are called “cold chains”.

Due to strict temperature requirements of vaccines, transportation and storage was a new challenge for a geographically diverse state like North Carolina.

The Pfizer vaccine, for example, had to be shipped between -80°C and -60°C and could only be kept in a normal freezer at -20°C for two weeks. The Collaboratory required a reliable way to transport and store vaccines at very low temperatures.

They acquired freezers as a first step. But how could they continuously and remotely monitor freezers and vaccines to ensure an unbroken cold chain and successful administration of the vaccine?

They turned to SAS Cold Chain Integrity, a solution powered by SAS Analytics for IoT on Microsoft Azure, which securely transmits IoT data via the cloud so that organisations can navigate the complex system of cold chain logistics.

SAS and Microsoft analysed data from storing freezers outfitted with IoT sensors. The project monitored the impact of factors including: temperature, humidity, vibration during transport, opening and closing, duration in storage and freezer capacity.

Predictive insights and intelligent alerting capabilities were used to identify and address potential dosage loss and vaccine shortages.

“SAS shows us how the health of a freezer affects the health of the vaccine.”

Dr. Jeff Warren
Executive Director,
North Carolina Collaboratory.

collaboratory
science. policy. solutions.

Supporting you to **improve** lives with analytics

SAS and Microsoft can help you transform your health care outcomes with AI-driven analytics.

Find out more

See what happens when limitless scale meets confident decision-making.

Discover SAS Viya on Microsoft Azure

Ready to experience SAS Viya yourself, free for 14 days?

Start your trial

Alternatively, let's talk.

Our health care analytics experts are always available to discuss your needs.

References

[1]https://www.inha.ie/pre-eclampsia/#:~:text=Typically%2C%20preeclampsia%20occurs%20after%2020,to%20diagnose%20and%20manage%20preeclampsia

[2]https://www.preeclampsia.org/what-is-preeclampsia