



## FUTURE PROOFING HEALTHCARE:

# Embracing the Promise and Challenges of Precision Medicine

*A HIMSS Analytics survey shows providers agree that precision medicine is important for patient health and well-being, but face uncertainties about approaches to implementation*

**M**ost healthcare providers believe precision medicine is important to the health and well-being of patients, yet many providers are uncertain about how to integrate precision medicine into their organizations. That's the conclusion of "Future Proofing Healthcare: Precision Medicine," a recent HIMSS Analytics survey, sponsored by Intel. Responses by business leaders, IT leaders and IT professionals revealed the current and future importance of precision medicine to healthcare providers

The survey defined precision medicine as "medical care designed to optimize efficiency or therapeutic benefit for particular groups of patients, which integrates all data available on an individual patient, incorporating genetics, environment and lifestyle; enabling a multi-factorial approach to the tailoring of treatment to the individual." The majority (84 percent) of respondents agreed that precision medicine is relevant to patients' health and well-being. More than half (57 percent) of respondents see precision medicine as relevant to their organization.

Respondents identified a number of drivers behind their organization's interest in growing precision medicine (Figure 1).<sup>1</sup> Primary drivers currently at play include patient risk assessment (44 percent), drug therapy monitoring (37 percent), financial efficiency (33 percent), disease prevention (33 percent) and early disease diagnosis (31 percent). Nearly half (47 percent) see early disease diagnosis emerging as the primary driver for precision medicine within the next two years.

### Approaches to precision medicine vary

Two-thirds percent of all respondents indicated they have a specific approach to precision medicine in place now. Ninety-two percent of all respondents expect to have a specific approach to precision medicine in place within the next two years. Specific approaches vary by organization size:

- *Third-party only:* Only 11 percent of all respondents currently rely exclusively on third parties to support precision medicine. Third-party support primarily takes

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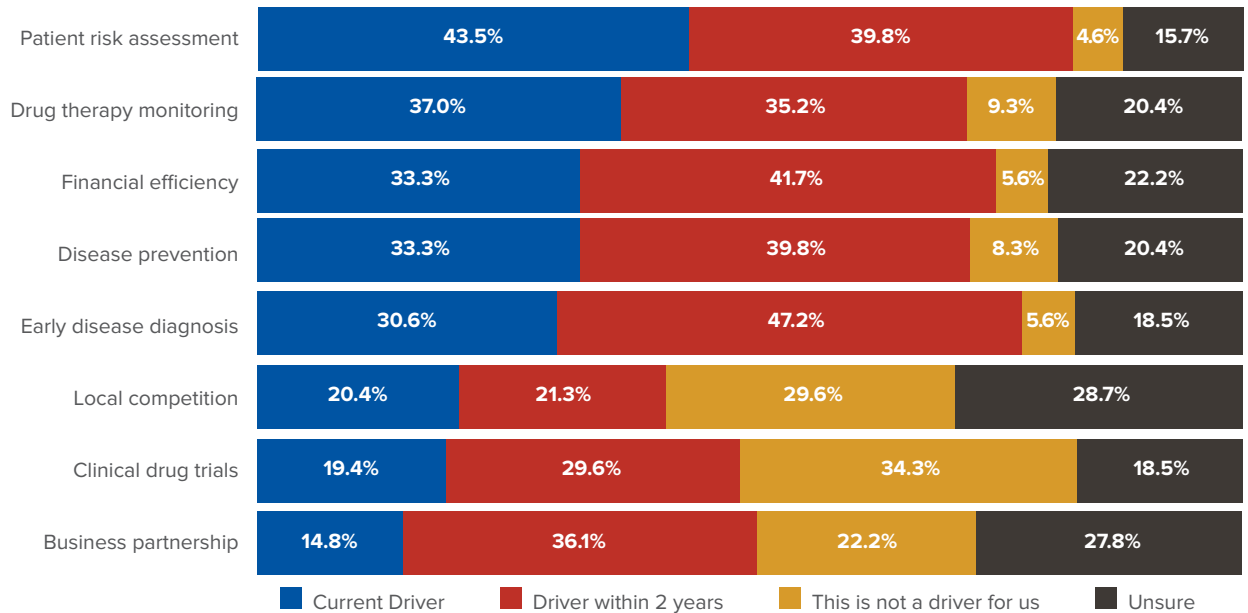
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**Figure 1. Respondents feel their organizations have many different drivers in growing precision medicine — but patient risk assessment leads the way.**

What are your organization's primary drivers for growth in precision medicine? Select all that apply.



the form of outside sequencing/lab support (69 percent of those who use third parties) and outside storage/computing capacity (44 percent of those who use third parties). Within the next two years, nearly one-quarter (23 percent) of intermediate-sized organizations (101-250 beds) plan to use a third-party approach exclusively. However, only 5 percent of large organizations (500-plus beds) expect to use a third-party only approach within the next two years.

- *Both in-house and third-party:* Nearly one-third (31 percent) of all respondents currently use a combination of in-house and third-party resources to support precision medicine initiatives. Within the next two years, the majority of respondents (56 percent), regardless of size, expect to use a combined approach to support precision medicine initiatives.
- *In-house only:* One out of five (20 percent) large providers (500-plus beds) expect to rely on an in-house only approach to precision medicine within the next two years.

Each approach has advantages and disadvantages. A third-party approach offers access to services, such as genomic sequencing, that providers may not yet have in-house. On the other hand, the advantages of an in-house approach include a faster turnaround time for laboratory results and the ability to develop an in-house

knowledge database. The in-house approach also builds the capacity for providers to differentiate themselves by developing specialized expertise.

The director of financial operations at a 500-plus bed provider said: “There is so much competition out there for your basic surgical needs and your basic in-patient needs. I think for us to be able to get ahead of [precision medicine] a little bit would be great, ... if we can get out, develop a great program and really push this and market it as a global approach, I think it [would feed] the rest of our service lines.”

Survey results showed the two primary areas of focus for precision medicine at this time are oncology (41 percent) and cardiology (31 percent). Forty percent of respondents also identified cardiology as an emerging area of focus within the next two years. Other emerging areas of focus for precision medicine included neurology (37 percent), prenatal screening (33 percent), pharmacogenomics (32 percent) and pharmacogenetics (31 percent).

The medical director of the clinical laboratory at an intermediate-sized hospital (101-250 beds) said: “I would guess that as this area of medicine grows, at some point, [our hospital] system will decide to bring it in-house and set up an in-system reference laboratory to do it. We’ve already done that with other types of testing.”

## Adequate technology infrastructure is critical

Respondents identified a number of supporting technologies as essential to implementing precision medicine initiatives (Figure 2). Just over half (51 percent) of respondents identified having a data warehouse as essential to the development of a precision-medicine program. The second essential technology identified by respondents was a laboratory information-management solution (43 percent). The third essential technology was identified as an analytics/data-mining platform for both structured and nonstructured data (38 percent).

Although only 20 percent of respondents identified a precision-medicine platform as a currently essential technology, almost half (45 percent) identified having a precision-medicine platform as an essential technology within the next two years. The director of financial operations of a 500-plus bed provider said: “We haven’t really gotten into that. ... I think that goes with finding the physicians who can specialize in [precision medicine], and once they tell us, ‘We like this platform or that platform,’ we would go from there.”

In addition to a precision-medicine platform, respondents identified three other technologies as essential to supporting precision medicine over the next two years. Those three technologies, each

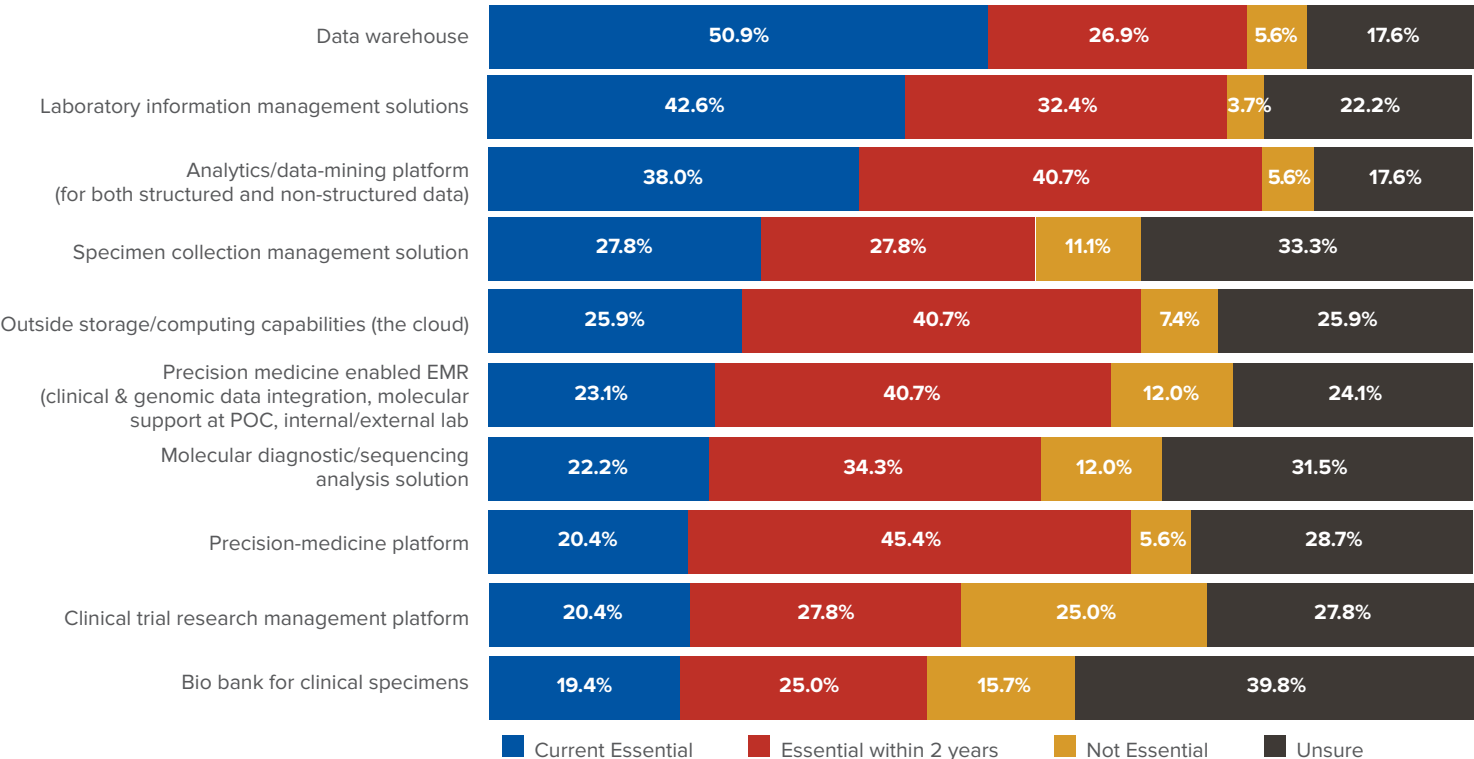
garnering 41 percent of respondents’ support, included an analytics/data-mining platform for both structured and nonstructured data; outside storage/computing capabilities (i.e., the cloud); and a precision medicine-enabled electronic medical record.

When asked to identify their organization’s biggest challenges around precision medicine, the majority of respondents (71 percent) identified budget/financial concerns as among their biggest barriers. Given these financial concerns, it is not surprising that 22 percent feel their current technology infrastructure leaves them unprepared to achieve organizational goals related to precision medicine. Another 60 percent believe their technology infrastructure leaves them only moderately prepared; and only 18 percent believe their current technology infrastructure has prepared them to meet their precision-medicine goals.

“You have to have the infrastructure to be able to deliver the service, and certainly it’s taken us a while to get that right,” the CIO of a 251-500 bed hospital said, adding that the hospital is “leveraging our relationships with our third parties to help us make sure we’re prepared to handle that. But the requirements do change, and the total composition and mix of our technology partners has to change to meet those demands.”

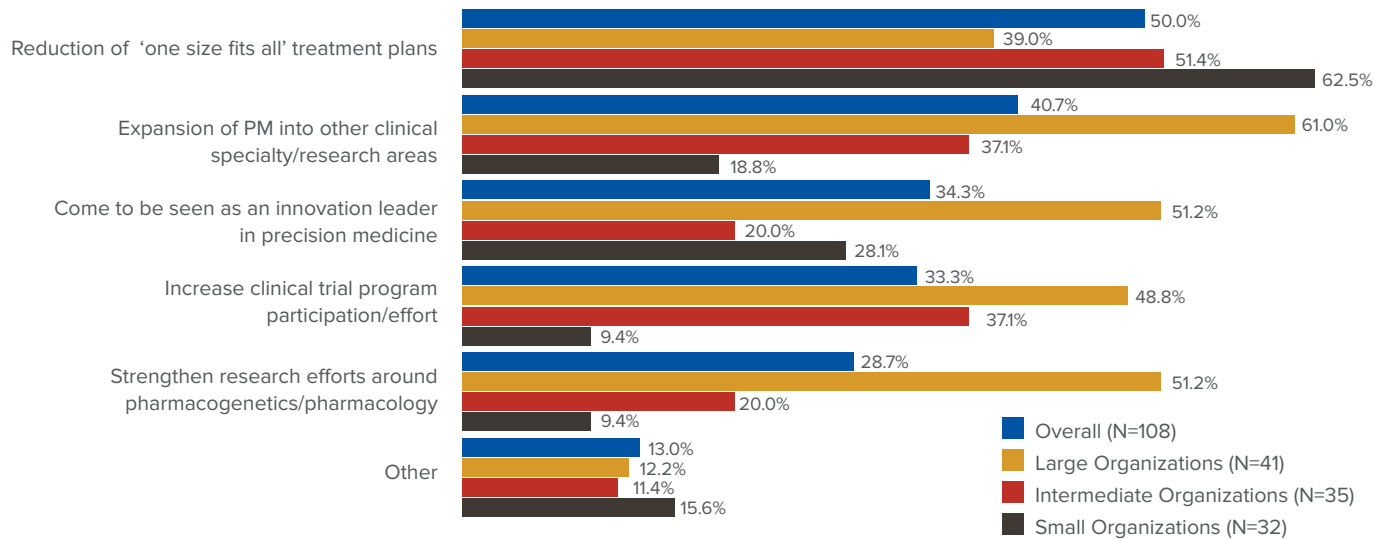
**Figure 2. When it comes to supporting precision medicine with technology, respondents feel data warehouses are essential.**

Which technologies does your organization consider essential in the development of a precision medicine program? Select all that apply.



**Figure 3: Larger organizations have a wider variety of goals for use of precision medicine, while small organizations are mostly focusing on “reduction of ‘one-size-fits-all’ treatment plans.”**

In the next 2 years, what are your organizations goals for use of precision medicine? Select all that apply.



Of the respondents who feel their existing technology infrastructure leaves them inadequately prepared to achieve their precision medicine goals, 49 percent plan to do what they can with the systems they have in place already. Slightly more than one-quarter (27 percent) intend to reinvest in scalable infrastructure; and nearly a third (28 percent) are unsure of how they are going to tackle their technology infrastructure challenges.

Concerns about current staffing levels and in-house expertise also leave providers unprepared to meet organizational goals related to precision medicine. Only 8 percent of respondents feel prepared with respect to staffing levels and in-house expertise, with 69 percent feeling moderately prepared and 23 percent feeling unprepared. The CIO of a 251-500 bed hospital said, “It’s almost impossible to get that level of expertise in-house. ... Most organizations are going to need to team up with a larger university research-based organization that has the depth, the strength and the expertise.”

### Reducing the use of ‘one-size-fits-all’ treatment plans

Despite the challenges, providers outlined a number of goals related to precision medicine that they hope to achieve within the next two years (Figure 3). Although the priority of goals varied somewhat by organization size, the majority of providers agreed that the No. 1 goal

of precision medicine is to reduce the use of “one-size-fits-all” treatment plans.

The medical director of the clinical laboratory at an intermediate-sized hospital (101-250 beds) described the difference precision medicine versus one-size-fits-all made for a lung cancer patient at his institution. “In the old days, we’d look at statistics,” he said. For example, according to statistics, out of 100 patients diagnosed with lung cancer, 15 percent were alive at five years. “Statistics are nice for looking at trends and looking at how treatments perform in populations, but to the patient, it’s really kind of meaningless. Making it precise to the specific patient is really important, both to the patient as well as the doctor. It helps in planning courses of treatment.”

With one particular cancer patient, the physician was able to use molecular-level diagnostics to identify a specific mutation found in fewer than 5 percent of patients diagnosed with non-small-cell carcinoma of the lung. “For the patients who have this particular mutation, there is a specific prescription medication that really makes a huge difference. ... If she just got standard chemo and radiation therapy, she would have been lucky to live six months,” he pointed out. “But she is still alive, and it has been six years. It’s unbelievable. But she has that mutation, and she is getting the right drug. That, to me, speaks to the power of precision medicine.”

<sup>1</sup> “Future Proofing Healthcare: Precision Medicine,” conducted by HIMSS Analytics, on behalf of Intel, September 2017.