

Managing population health takes on a new look

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April 2017—Quarantine, antiseptics, sanitation, vaccination. Over more than a century and a half, as these staples of public health have evolved, they have proved that stunning improvements in general health status can result from adopting broad public policies based on data and statistical analysis.

But just in the past few years, the concept of “population health” has been grabbing attention as a framework for strategizing more tailored improvements in patient care—with laboratory data as one of the linchpins of those strategies. Large health care systems and diagnostics companies, among others, are increasingly seeing the value of a population health approach to process improvement.

As experts in the field explain it, population health is similar to public health but addresses more finely sliced subsets of people receiving health care. Keri Donaldson, MD, founder and chief executive officer of Prescient Medicine, prefers the term “population health management” because it connotes action. Population health management is more targeted than traditional descriptive public health policies, he says, because it “provides for a comprehensive way to classify conditions and stratify risks or underlying health trends across multiple data sources into one analytic stream so we can determine which ones are influencing public health.”



Dr. Donaldson

After identifying populations at risk through laboratory and demographic data analysis, population health management makes it possible to focus resources on that subset at risk, he explains. “You’re really drilling down on interrelated conditions that influence health over the course of a life, and what systemic variations may influence those conditions.”

For example, a simple proactive public health approach might say women should be offered or receive age-appropriate breast cancer screening consisting of self-exams, annual physicals, and mammograms. “But the general idea of a population health management approach is recognizing that we are in a capitated environment with limited resources, so let’s focus on where the current system is failing. By determining gaps in the current system, identifying the patients who have a high likelihood of benefiting from additional re-sources—the ones who are at highest risk—we can design interventions that can help change the outcome before it occurs or progresses.”

“A good population health approach really tries to answer the question: ‘So what?’” says Dr. Donaldson, who is also medical director of Penn State Hershey Institute of Personalized Medicine. “You can see you have genetic variation that places you at higher risk for cancer, or you have under-reported diabetes, or you have 50 percent of the population that is not on statin but should be. But those are just facts or statistics. Population health allows us to address these questions, ‘What are you going to do about it? How do you change that?’”

Prescient Medicine is a predictive medicine organization that offers predictive intelligence, Dr. Donaldson says. “We believe that earlier identification of risk and earlier detection of disease leads to more informed decisions.” Early at-risk patient identification and surveillance, reduction in unnecessary procedures, early identification of changes in prescribing practice, and custom, multifactorial decision support are among the services Prescient provides.

A collaborative blood services module, which can overlay or be built within any LIS or EMR, is an early success, he says. "It's been able to reduce the red cell utilization rate significantly—by 17 to 20 percent just in nonsecular trend analysis. If you take into account secular trends, the number is 30 to 40 percent. In a midsize institution, that's millions of dollars per year."

Haemonetics is a competitor of Prescient in blood utilization, but in other areas of population health management, "Prescient has no defined competitors," Dr. Donaldson says. "We're sort of a trailblazing kind of organization. If you look at comprehensive opioid solutions or pain management or pain control, not a lot of people are playing in that space. In addition, many people are dropping out of personalized genomics because they can't figure out how to make it make money. I think 14 or 15 PGx labs closed last year."

One way pathologists can improve disease outcomes is by looking for opportunities within the hospital or system to implement a rule in the electronic health record to better identify a patient population, Dr. Donaldson says. With its oral anticoagulation module, for instance, his group found that some patients at zero risk who should not have been on an oral anticoagulant were receiving it, while only about 80 percent of those at high risk were receiving it.

"So you ask, should we change how providers are interacting with patients? Send them a letter? Post flags?" The project leaders realized there was an opportunity to improve care. "So we've gone through and conditioned decision support on this idea. Providers receive a letter saying: 'Is this a purposeful action? Are you purposely not giving that patient an oral anticoagulant even though you know they have an overall risk-of-stroke score of six?'"

Some areas in which Prescient has programs, such as the comprehensive metabolic panel, are contained within the lab. At one time, in a more basic laboratory information system, built-in rules would put a hard stop on repetitive ordering of the panel and halt testing at the point of receipt, Dr. Donaldson points out. "The lab would see that the order was for a test with a previously normal result within 24 hours. That violated the rule, and they would throw it out."

The real source of expense is not in performing extra tests that waste only pennies, however. It's when one of the tests is abnormal and is followed up with unnecessary workups, he says. In its study at a 1,200-bed hospital system, Prescient moved beyond the old LIS model to cumulative probability analysis. "If I have one normal calcium, how likely is it that the second calcium in a single admission is going to be normal? What about after two normals or three normals?" The algorithm set a time limit on how many comprehensive metabolic panels can be ordered within a day.

The result was a more than 50 percent reduction in the number of glucose and chloride tests ordered, 40 to 50 percent reduction for magnesium, 60 percent for phosphate, and 30 percent for albumin. Prescient is now implementing the next version of this algorithm (linking it to ICD, location, point of order, or indication) in its logic engine. Eliminating standing orders was another application of this same algorithm.

But population health can also relate to an evolution of lab information outside the laboratory, to the systems-based enterprise level, Dr. Donaldson says. "Our original work on areas like urine microanalysis was done at a 550-bed hospital. We modeled it using lab-stored specific data as well as some demographic data, but you don't have control of decision support within an LIS or at the EHR level."

"Our type of decision support lives at a data universe that allows application programming interfaces, and those APIs overlay any input or output. So the data may come from the LIS or the EHR, but [for some areas], you're at a level outside the LIS." For instance, for drugs of abuse and pain management—an expanding area for Prescient, which has active programs in Pennsylvania, New Jersey, Florida, and Missouri, with Illinois on deck—the customer base tends to be broad with diverse applications.

Closing the quality gap is the key for hospitals as well as insurers, and simply not performing a test is one way to reduce health care dollar outlays, he says. "For example, a lot of people close the quality gap on catheter-associated urinary tract infections [CAUTIs] by just not culturing these patients. We actually prevent CAUTIs from occurring by using high-sensitivity multi-parameter urinalysis. That gives you an opportunity to increase return

directly with the insurer, or through partnering with Prescient customers, whether they are small mom-and-pop shops or a very large enterprise. If you chew through their data, you can increase return and decrease costs.” Depending on the desired outcome, that could be identification of diabetic patients, increased compliance with a statin regimen, or decreased length of stay for hysterectomy patients.

Prescient’s ability to address risk factors through population health management connects directly to its business model. One example: “One of the things that’s hot right now in psychiatric hospitals is if they define and treat comorbidities appropriately, they get a higher reimbursement. If they are treating a person for psychiatric illness but the patient also has renal disease, hypermetabolic syndrome, or an infectious disease, they receive more if the comorbidity is classified and treated appropriately. So as an analytics firm, if we help you define testing for that population or to classify disease better with the testing you’re already doing, Prescient’s value to the client can be directly measured with the increase in recoveries.”

As a long-time public health specialist, James Halloran, MSN, RN, CNS, FAAN, deputy chief consultant for strategy and planning in Population Health Services at the U.S. Department of Veterans Affairs, confesses he might be a bit biased. He does see “public health” and “population health” as very similar. “There are certainly tools in the public health armamentarium that we use in population health, especially surveillance and epidemiologic procedures.”

But no one has a copyright on the term, and the VA’s model emphasizes that population health involves attention to nonclinical social determinations.



Halloran

“Those of us who wear white coats and are very egocentric think that everything that matters is clinical: If it’s not on my chart or not in a field on my computer screen, then it doesn’t matter,” Halloran says. “But population health says there are a lot of [nonclinical] things that do matter.” Socioeconomic status, occupational exposures, geography, access to water, and access to food are examples. The VA measures, monitors, and identifies trends that affect veterans’ health and tries to find patterns that can “turn numbers into knowledge” that will help improve the health of veterans and their families.

Population health is an evolving science, Halloran says, “and the specific models and metrics have been discussed for years,” beginning as classic public health and strongly influenced by disease management models popular in the 1990s. A 2013 Institute of Medicine (now National Academy of Medicine) report proposed a framework for quality measures in population health and used the term “social determinants of health.” At the VA, Halloran says, “Population health goes beyond the model of sickness care to understanding as many of the variables as possible that contribute to the health status of veterans.” Laboratory and pathology data are important, but they’re not the only part of getting to an understanding of veterans’ health. “So they’re necessary, but not sufficient.” Electronic data resources have been key, he adds.

Pamela S. Belperio, PharmD, has been working with the hepatitis C program in the VA for about six years. As a clinical pharmacy specialist for patient care services/population health, Dr. Belperio helps the VA roll out education for national initiatives and policy and works with the pharmacy benefits management group to make the medications available across the VA system. Her responsibilities relating to population health include national reporting on numbers treated and untreated, numbers tested, and numbers cured after treatment, all using the VA’s national clinical case registry and corporate data warehouse, or CDW.

Recently, each of the VA's 18 VISNs (Veterans Integrated Service Networks, regions of roughly eight to 10 VA facilities each) put together innovation teams to map out a system redesign process, developing processes to improve the current state of care. One of these teams led by Ron B. Schiffman, MD, chief of pathology and laboratory medicine at the VA facility in Tucson, Ariz., demonstrated what can be done with population health by reaching out to veteran patients who would benefit from HCV screening.

A patient registry was developed that included all VA-enrolled patients born between 1945 and 1965 who had no record of ever having been tested for HCV infection. This is the high-risk "birth cohort" population that the CDC and VA recommend for targeted screening. Dr. Schiffman and his team, in collaboration with the medical staff, developed a patient notification system using letters that could be automatically created and mailed from a central printing facility in Sacramento, Calif.

"Based on the patient registry, a letter is triggered to the appropriate patients explaining why it's important for them to be screened, and that if they have any questions they can call a certain phone number and talk to a primary care physician. Or if they want to go ahead, the letter can be brought into the various phlebotomy stations we have and they can use it as a requisition form to have their HCV testing performed," Dr. Schiffman explains. The population health team also uses letters because "not all of our patients have information systems where they can get secure messages. Many do, but we can't count on all of them receiving emails, so we find that old-fashioned mailing system seems to be effective, and it also serves as a lab requisition."

The laboratory team and primary care physicians collaborated. "We've sent out almost 8,000 letters at this point. Notification is automatically documented in the patient record by triggering a note informing the provider that the letter's been sent," Dr. Schiffman says. Once tested, another automated letter is created and sent to patients with their results and, if needed, instructions for follow-up care. Patients who test positive are immediately contacted and seen by specialists for further management and treatment. About 35 percent of patients who received the letters have been tested so far. "We've had a little over one percent of the patients who have been screened test positive for HCV, and all of those patients have had access to care and treatment."

The Tucson VA is now remotely managing the program to support HCV screening at other VA health care facilities such as San Diego and Albuquerque, with more on the way.

Interestingly, some of the patients who received the letter knew they had HCV (they were diagnosed outside the VA) but were not aware that a new curative treatment was available. "That letter prompted them to then go back and seek retesting and access to care at our VA facility," Dr. Schiffman says.

The initiation of a VA corporate data warehouse—a national, updated repository of data from the VA's computerized patient records of all VA facilities—helped bring a change to the care of veterans with HCV, Dr. Belperio says. "Originally, our population health care group had developed and maintained a national HCV clinical case registry of everyone with a confirmed laboratory result or ICD-9 diagnosis. Providers at a VA facility can use the registry to generate customized local reports that could be used to assess and manage their population of HCV-infected patients. It can be set up so that every morning an updated report is waiting." The registry data are used nationally to report metrics and outcomes that guide clinical care, she says.



Dr. Belperio

But until the warehouse came along, there was no good way nationally to look at a particular patient population at

higher risk for HCV that had not yet been tested. “The CDW provided a way for us to look for the 1945 to 1965 birth cohort, a group recommended by the CDC to have HCV testing, and see who in that cohort had not been tested.” The data warehouse also made it easier to generate a list and automate the letter mailing.

Automated letters are not new, but in the past they were used to notify people of test results or appointments. The difference here lay in contacting a certain group of veterans to say, “You’re at risk for this disease. We need you to come in and get tested for it,” Dr. Belperio says. “We have the tests already ordered. You just need to come into your local lab with this letter, you don’t have to see the provider, and we’ll notify you of the results.”

“That’s really important for the patient, because it’s one less appointment they need to come in for. I’m not aware of other programs that have been so impressive in identifying people who are at a very high risk for a particular disease, notifying them to get tested, having orders in place for the testing to occur, and then notifying them of the results.”

The VA has seen the highest testing rates for HCV in that birth cohort of any large health care system in the U.S. by far, she says. “We’re at about 75 percent of that birth cohort being tested, and nothing that I’ve seen in the literature is over 50 percent.”

But the approach is not limited to HCV. “Any other disease state where there might be a need to reach out to people who are unaware they have the disease, this approach could be used for.” For example, Dr. Belperio is involved in a pre-exposure prophylaxis program for HIV that will administer medication to people who are at a high risk of developing HIV.

Having new medications that sharply improved HCV treatment gave impetus to this population health project. “That was the thing that transformed HCV, because we had these new medications available and we wanted to get as many people in and cured as we could,” Dr. Belperio says. “If there were some new diabetic medication that would be life-changing for patients meeting specific criteria, you could use the [data warehouse] to identify the markers of patients who would gain the greatest benefit from the new treatment. Several transforming medications are on the horizon and expected to be quite life-changing compared to what we’ve had, so we’re expecting that in the future, that will affect the VA’s choice of other population health projects.”

Unlike breast cancer, lung cancer, and cervical cancer, “liver cancer is rising and the main reason is HCV. It’s also the leading cause for liver transplants,” Dr. Schiffman says. So he thinks of the VA’s HCV testing notification program as not just a screening program to help prevent and cure HCV and chronic liver disease, but also as a cancer prevention screening program.



Dr. Schiffman

“This is one example of where pathologists can get involved with patient care with regard to population health,” Dr. Schiffman says. Traditionally, utilization management has focused on reducing unnecessary tests or removing obsolete testing. “But a widely quoted study has shown that it’s more common to omit testing that needs to be done than to over-test. So in terms of outcomes, that’s where we’re trying to go.”

Dr. Schiffman cites three areas of laboratory testing where pathologists can contribute to population health approaches. “One is screening high-risk populations. Another is chronic disease monitoring such as HbA1c for patients with diabetes. Those are patients who might fall through the cracks but should be getting monitoring.” High-risk medications present a third area: “This would include patients on oral anticoagulants, or high-risk

medications like amiodarone that require thyroid testing because of the risk of side effects.”

One of the strategies is to try to improve awareness of clinicians or help them use decision support techniques that are built into the ordering process, he notes. “So there will be a pop-up, for example, that will remind the clinician it is time for the patient’s HbA1c test because they are in a population that requires screening.” As decision support systems, however, pop-up menus have two problems, Dr. Schiffman cautions. “One is that clinicians are being inundated by alerts.”

“The second issue is the doctor doesn’t necessarily get an alert if they’re not interacting with the patient’s medical record. So if there hasn’t been a patient encounter, then there may not be an opportunity to get the alert, order the test, or make a decision about that patient’s screening or monitoring.”

If the pathologist has access to a patient registry, and it could include HCV, oral anticoagulation, or other similar patient populations that require lab monitoring, then that pathologist could use that information to determine whether the testing has been done. “If it has been done, then that’s fine—move on to the next patient. But if it hasn’t been done, then develop some type of intervention in partnership with the patient’s provider to provide easier access to needed testing.”

An approach similar to the VA’s HCV program would involve taking a registry of patients with diabetes, “to remind them in a primary care clinic of their HbA1c screening, so we can check on patients who have not had their testing performed within the specified period.”

The pharmacist is an important partner, says Dr. Schiffman. He or she might have the most knowledge about what testing might be needed for specific medications. “And then you can tie that list into your LIS to see if the patients have had their testing done for potential drug side effects.”

The VA is poised to launch a new population health screening that addresses patients’ opioid use. “There’s a lot of attention, particularly in the VA system, to making sure that pain management is optimized, and one part of that program for patients receiving pain medication is that they get periodic urine drug screening to check for compliance,” Dr. Schiffman says.

Ensuring that this occurs will require taking a registry of all patients undergoing pain management, checking to see if they’ve had their periodic urine screen performed, and then sending the same type of letter used for HCV screening, to remind the patients and to provide them with a ready-made requisition for the testing. “So population health goes beyond just screening for chronic disease; it includes compliance with health management programs as well.”

Before the birth-cohort HCV screening program was launched, Tucson had slightly below average compliance on HCV screening. “There was an option in the electronic health care system to remind clinicians about patients who needed HCV testing, and our facility had the auto-alert turned off.” This may have played a role in lowering the compliance level.

The current 75 percent compliance with HCV screening throughout the VA is about twice the national average. In September 2016, a VA database study showed that new drug regimens for HCV have resulted in high cure rates among patients within the VA’s national health care system. Among patients with the most common strain of HCV, 93 percent of veterans receiving treatment were cured.

The VA’s HCV program shows how pathologists can add value to health care by making sure patients have the testing they need, Dr. Schiffman believes. “In this particular case, we identified that HCV was a problem, and so we went to GI and our medical staff and said, ‘Here’s a solution that will let us increase our screening by identifying this population that needs screening.’ So this was a pathology-driven process.”

Population health will continue to influence health care systems’ approaches to improving patient care, Dr. Donaldson believes, for two reasons. “No. 1, the complexity of the data within an EHR or patient medical record at this point exceeds the intellectual and analytic capacity of any one person. No. 2, applying that data to determine

resource allocation is even more difficult. So when you're trying to make decisions based on complex data that have an impact on people's lives, and also reflect a wise use of resources, you're really out of your depth. You need decision support. Getting people to understand these two points is what population health management is all about."

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