Innovative 'HUB' model improves infant mortality and saves money: Saving the Smallest

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MANSFIELD, Ohio -- In 1997, a husband and wife physician team arrived in this once-thriving manufacturing city convinced of two things: that even the best medical care in the world can't make people healthy, and that the healthcare system was not designed to find, reach or serve those likely to need it the most.

Drs. Sarah and Mark Redding had spent years in Alaska and Maryland partnering with community health workers to gain the trust of pregnant women at high risk of delivering premature or underweight babies, a risk factor for infant mortality.

In Mansfield, the doctors formed CHAP, the **Community Health Access Project**, to accomplish the same goal. They also made one simple but dramatic change to the way they worked: Those who cared for the high-risk women were paid only if the women reached predetermined goals, such as delivering a healthy weight baby, having stable housing, or enrolling their children in enrichment programs, known to reduce their risk of bad health outcomes.

"It's not rocket science," says Sarah Redding. "Without accountability, you may happen into success, but you're not ensuring it."

The model, likened to air traffic control for a city's health and social services, used a centralized entity, or "HUB," to coordinate pay and referrals that cross administrative boundaries.

Now in its 11th year, the HUB model has worked so well in Mansfield that CHAP participants deliver low birth weight babies at less than half the rate of women at similar risk who don't participate.

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And it's saved a lot of money. Researchers estimate that each dollar invested returns more than $3 in short-term healthcare costs and $5 in long-term costs, from neonatal intensive care unit stays to emergency room visits.

The model, now called the Pathways Community HUB, has been so successful for high-risk pregnancy that it's spread beyond Ohio (where HUBs also exist in Toledo and Cincinnati) and is being used to tackle other problems, such as adult chronic diseases and more complex ones like human trafficking.

And state officials hoping to improve Ohio's miserable infant mortality record gave the model a $4 million vote of confidence over the summer, expanding Ohio's existing HUBs and launching new ones in Akron, Youngstown and Columbus.

Years of trial and error lead to big payoffs

When the Reddings arrived in Mansfield, their first task was to figure out where the most high-risk women in the city lived. At the time, that involved a table-sized map, birth and death records, and a whole lot of colored push pins.

On their map of the city, two areas in particular stood out, bristling with the red and yellow flags that marked where babies were born too soon and too small, or where babies had died. Over the next two years, the Reddings deployed their community health workers to these areas.

In these census tracts, women were delivering low birth weight babies at an astounding rate-- 23 percent-- almost three times the county average. It seemed a good place to set up camp, so CHAP opened its doors for the first time in an old schoolhouse smack in the middle of these two "hotspot" areas.

Over time, they beefed up their staff and had almost every agency in the city working together, using the same process, measuring their progress and recording data on the women they all served in the same manner.

It was an unprecedented level of cooperation, all designed to help pregnant women deliver healthy babies.

The only problem, Sarah Redding says with a laugh, is that it didn't work.

It wasn't until 2005, when a funder helped the team switch to the "pay for performance" model, that things really started to change, Redding says. Since then, four of the five state Medicaid managed care plans have signed on to the HUB, as have many of the city's social service agencies, making it sustainable.

Health workers build trust in homes, coordinate care

On a sultry Wednesday morning in mid-August, Maria Thompson waits on the front porch of her home in Mansfield for the arrival of her CHAP community health worker, Kimberly Phinnessee.

Thompson, 30, is 32 weeks pregnant and expecting her fifth baby, and first girl, in October. Phinnessee, a Mansfield native and one of CHAP's first hires, is also a mother of four boys. She's been working with Thompson since her last pregnancy when she delivered her now 3-year-old son Kyran.

The women are relaxed during the hour-long visit as the conversation ranges from prenatal care to Thompson's current sewing projects.

Kyran Thompson, born a healthy 7 pounds, whizzes around the living room, bouncing off the furniture and throwing himself on both women's laps.

Between pauses to distract the rambunctious toddler, Phinnessee takes out a tablet and logs Thompson's answers to a series of required questions about doctor's appointments, medication, signs of depression and recent arrests.

Both women guffaw. "I hate that one," Phinnessee says, referring to the arrest question, "but I have to ask."

"So did you keep your last prenatal appointment?" she continues.

"Yes," says Thompson. "And I have an appointment tomorrow with the regular doctor. I've been contracting the last few days."

Thompson's at high risk of early delivery due to a common condition called incompetent cervix, which can cause the cervix to dilate too early in a pregnancy and lead to pre-term labor.

Her first two boys were delivered early. Tristan, now 9, weighed only three pounds and spent several weeks in the neonatal intensive care unit before he was allowed to come home.

"I don't ever want to experience that again," Thompson says. "It was the worst thing in the world, to not be able to be with your baby and take your baby home."

Low birth weight babies, born less than 5 pounds, 8 ounces, are more likely than babies of normal weight to have health problems as a newborn and often need expensive care to treat conditions related to premature birth.

Because of her history, Phinnessee is tasked with helping Thompson deliver a healthy weight baby. Phinnessee's also tracking Thompson's progress through several other so-called "pathways" including help with medications, food assistance and childcare.

She and the other HUB providers who take care of Thompson won't be reimbursed for their work unless Thompson reaches the specific goals associated with each of the pathways, such as seeing a specialist for medical care or enrolling a child in preschool, among others.

Not business as usual

It's not how healthcare providers, or social service agencies, are used to doing business, Redding says. Usually, they're paid for the number of office visits, the number of procedures, or the number of "activities" they complete, none of which measure how well a patient fares.

Not everyone was on board with the new model when it launched in 2005. Some local agencies opted out immediately (particularly those that didn't serve these high-risk women and families), and many didn't like the idea of a central entity controlling how or when they received payment.

Even the agencies that did serve these high-risk families had a bit of a wake-up call when they switched to the new model, though, Redding says. About 200 clients they had been serving were dropped because, surprisingly, they didn't have any identifiable risks, or pathways, to help with.

Redding explains: "It was very eye-opening to see how we had built our caseloads around more compliant clients," like those who never missed appointments, "and not on the individuals in our community that really needed the care the most."

Not better healthcare, 'just better care'

In a state like Ohio, which ranks among the worst for pregnancy-related health outcomes, successes like those achieved via the HUB model stand out.

A 2014 study in the Maternal and Child Health Journal showed that among mothers who participated in the CHAP program, 6.1 percent had low-birth weight babies. Among non-CHAP participants, more than twice as many babies — 13 percent — were low-birth weight. CHAP's low-birth weight rate was far below the state average (8.6 percent) and the national average (8.3 percent).

And the high-risk women who delivered healthier babies in the CHAP program started prenatal care at the same time and had about the same number of prenatal visits as the non-CHAP participants they were compared to.

On average, the CHAP women received help with five other areas, or pathways, that community health workers flagged during assessments as increasing their risk for poor health, such as needing food assistance, having unstable housing or employment, or lacking transportation to appointments.

"It wasn't just the pregnancy," Redding says. Everyone thought the women fared better because they were getting good healthcare, she says. In fact, Redding says, "they're just getting better care."

In Toledo, the model has been equally successful. Black women participating in the program the past two years had a low birth weight rate of 9.5 percent, far below the national average of 13 percent. And about 80 percent of participants made it to a first postpartum appointment within two months; in 2013, **less than two-thirds of women on Medicaid** made it to this appointment.

Jan Ruma, director of Toledo's HUB and vice president of the Hospital Council of Northwest Ohio, said the achievement is more impressive when you consider that the women they target usually have about six or seven other risk factors for poor birth outcomes, making them the most at-risk in the community.

Outcomes like these not only translate to better health, they also save money.

Others take notice

With the cost of premature delivery estimated at roughly 12 times the cost of that of a healthy baby, the HUB model's success has attracted the attention of health officials and policy makers looking to save both lives and money.

In 2010, the federal Agency for Healthcare Research and Quality **chose the HUB model as one of its targets for an "innovations exchange"** to spread effective practices that improve healthcare delivery and promote the goals of healthcare reform, including controlling per capita costs.

The National Science Foundation has since funded a systems engineering study of the model and a non-profit in Maryland called the Rockville Institute now **offers certification for cities that want to start a HUB**.

There are now certified Pathways Community HUBs in **Albuquerque, New Mexico** and **Saginaw, Michigan**.

A $4 million grant from the state's Commission on Minority Health will expand Ohio's existing HUBs to reach more women, and fund the certification of new HUBs in Akron, Youngstown and Columbus, slated to begin over the next six months.

Cleveland, Dayton, and the state's southeast region were also eligible to apply for the funding. Of the three, only Dayton applied.

Sandy Oxley, CEO of **Voices for Ohio's Children**, a health policy and advocacy organization, said the HUB model decreases stress for families by acknowledging the multitude of factors that affect health outside the doctor's office.

"If an expectant mother is worried about how to feed her other children and how to keep her electricity on... clinical outcomes aren't going to be top of mind," Oxley says.

The HUB isn't a cure-all, to be sure. Some communities have struggled to get it off the ground. In Southeast Ohio, a version of the HUB still exists after a launch in 2012 and a subsequent redesign, but it's not certified.

Cities need some infrastructure in place to support it, Redding says. Throwing one more thing into a chaotic and fragmented system isn't going to make any difference.

The bottom line for many cities that implement the HUB model is that business as usual is no longer an option, Ruma says.

"It really comes down to accepting that what we're doing right now isn't working."

On September 30th, Maria Thompson delivered a healthy, 6 pound-13 ounce, baby girl. Brooklyn Thompson, now 17 weeks old, is healthy and up to date on her immunizations, her mom says. Her room, the first her mother could decorate for a baby girl, is awash in pink owls.
