

Bridges for Newborns: Preliminary Results of an Updated Evaluation

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Executive Summary

The Bridges for Newborns Program was launched in 2000 as an Early Action Program funded by the Children and Families Commission. In 2003 the program was modified to incorporate a standardized screening tool that hospital staff use to determine whether the family needs a referral to community-based services. In addition, the program was broadened to include home visitation services to which the hospitals refer families of newborns when warranted by the initial screening (see Table 1, page 3). A program evaluation was conducted of the new Bridges model in 2003 to assess the validity of the standardized screening tool and the effectiveness of the home visitation services. The pilot evaluation demonstrated the effectiveness of the program but raised two additional questions:

- **What is the true level of need in the population referred to Bridges Home Visitation service providers?**
- **Can the continuing effectiveness of the Bridges network of services be demonstrated?**

A corollary to the first question might be: How accurately are hospital staff able to assess risk in the few minutes they spend with the mother compared to the risk seen by a home visitor after several visits? To answer these questions, the Bridges screening tool was completed three times during the course of providing Bridges services to a family.

1. In the hospital after the baby was born
2. Within three weeks of the beginning of home visitation services
3. At the completion or after one year of home visitation services, whichever came first

The results of the first and second screenings were analyzed to answer the first question. The expectation was that the hospital screener would have insufficient time and information to uncover all the risk, resulting in a lower score than the home visitor, who would have had more time to get to know the family. The result was just the opposite, the hospital screeners and home visitation providers made very similar assessments of family risk, and in fact, in the area of financial resources, hospital staff actually *overestimate* risk. From this, one can conclude that hospital screeners are doing a good job of identifying the families most at risk and referring them to home visitation services (Table 4, page 8).

The results of the second and third screenings were analyzed to answer the second question. In this case, the expectation was that the third and final score would be lower than the second score. The findings demonstrated that significantly lower risk scores were observed in the overall score at the final screening as well as in all six subcategories of risk (Table 5, page 9). Overall risk fell by 10 points on average, a decline of some 20 percent. The Bridges network of services continues to demonstrate a high level of effectiveness as measured by significantly lower risk in the families it serves.

Introduction

The Bridges for Newborns Program was launched in 2000 as an Early Action Program funded by the Children and Families Commission. Initially, the program activities were all hospital-based, but in 2003 the program was modified to incorporate a standardized screening tool that hospital staffs use to determine whether the family needs a referral to community-based services. In addition, the program was broadened to include home visitation services to which the hospitals refer families of newborns when warranted by the initial screening. As a consequence of these changes, the Bridges Home Visitation services became the focal point for assuring that newborns continue to be insured and receive well-child checkups and immunizations. The Home Visitation program also addresses other needs, such as parenting education, home safety, and referrals for psychosocial services.

A program evaluation was conducted of the new Bridges model in 2003 to assess the validity of the standardized screening tool and the effectiveness of the home visitation services. The pilot evaluation demonstrated the effectiveness of the program but raised two additional questions:

- **What is the true level of need in the population referred to Bridges Home Visitation service providers?**

One of the continuing concerns of Bridges Hospitals and Home Visitation Providers is that there is insufficient time for hospital staff to develop a relationship of trust with a new mother while she is admitted to the hospital to give birth. Consequently, it is unclear whether the initial screening done by the hospital captures the family's true level of need. In fact, there is substantial anecdotal evidence that more reliable information about the family's true status only becomes available when trust has been established between the family and the home visitor. This evaluation will attempt to learn the true level of need of the families that receive Bridges Home Visitation services by comparing the screening results provided at the hospital to a screening provided by the family's home visitor once a trusting relationship has been established. The evaluation hypothesized that risk levels assessed during the hospital admission would be significantly higher once the family began to confide in the home visitor.

- **Can the continuing effectiveness of the Bridges network of services be demonstrated?**

The Bridges pilot evaluation demonstrated the effectiveness of the new model over six months. However, the program is designed to provide home visitation services over the course of a year or more, depending on the family's needs. Therefore, this evaluation examines differences between screening scores obtained in the early weeks of home visitation to those obtained after one year or sooner if a family no longer required services. In this case, the evaluation hypothesized that risk levels would fall significantly over the service period.

This report describes the methods employed to address those questions and well as the results that will serve as preliminary answers to them. The study is currently ongoing as many families enrolled in the evaluation are still receiving services and have not yet been screened for the final time.

Evaluation Method

For each participating family, completed screening forms from three separate risk screenings were submitted to the evaluation team for analysis:

- (1) The screening tool completed at the hospital
- (2) The screening tool completed within three weeks of the onset of home visitation services
- (3) The screening tool completed at the end of services or after one year of services.

Table 1 presents a summary of the 24 items used to assess a family's risk. On the basis of the screening score received in the hospital, families that received a risk score of 46 or higher were referred to a home visitation program and their completed hospital screening form was forwarded to the home visitation provider. Home visitors then completed the second and third screenings and forwarded all three de-identified surveys to the evaluation team.

Table 1. The Twenty-Four Risk Screening Items and Their Individual Weights

| <i>Risk Factor</i> | <i>Risk Rating Scheme and Weights¹</i> | | | |
|--|---|------------|------------|-------------|
| | <i>None</i> | <i>Low</i> | <i>Mod</i> | <i>High</i> |
| 1. Mother's Age | 0 | 6 | 12 | 18 |
| 2. Mother's marital status | 0 | 2 | 4 | 6 |
| 3. Number of other children in home | 0 | 1 | 2 | 3 |
| 4. Mother's use of English | 0 | 1 | 2 | 3 |
| 5. Mother's highest education level | 0 | 3 | 6 | 9 |
| 6. Annual household income level | 0 | 3 | 6 | 9 |
| 7. Adequate and timely prenatal care | 0 | 4 | 8 | 12 |
| 8. Health coverage (mom) | 0 | 1 | 2 | 3 |
| 9. Medical/Mental Health Problem | 0 | 6 | 12 | 18 |
| 10. Tobacco smoke in home | 0 | 1 | 2 | 3 |
| 11. Current housing conditions | 0 | 3 | 6 | 9 |
| 12. Level of family support | 0 | 2 | 4 | 6 |
| 13. Transportation a barrier | 0 | 1 | 2 | 3 |
| 14. Adequate food in house | 0 | 3 | 6 | 9 |
| 15. Infant feeding issues | 0 | 3 | 6 | 9 |
| 16. Mother's intent to provide well-baby care | 0 | 1 | 2 | 3 |
| 17. Mother's demonstrated awareness of resources | 0 | 1 | 2 | 3 |
| 18. Strength of maternal bond with infant | 0 | 5 | 10 | 15 |
| 19. History domestic violence or child abuse/neglect | 0 | N/A | 12 | 18 |
| 20. History of alcohol/drug use | 0 | 6 | 12 | 18 |
| 21. Infant coverage | 0 | 1 | 2 | 3 |
| 22. Infant source of medical care | 0 | 1 | 2 | 3 |
| 23. Infant medical problems | 0 | 6 | 12 | 18 |
| 24. Mother's worry about infant health | 0 | 1 | 2 | 3 |

¹ The Bridges representative in the hospital reviews the mother's chart and, in discussion with her, determines the level of risk for each item. She then circles the number that best indicates the level of risk observed. Since some items pose greater risk than others, some items are weighted more heavily than others (e.g., history of abuse or drug use). The circled values are then summed to create the overall risk score. Separate scores can be created in the same way for the six risk categories described in Table 3. Overall risk scores range from a low of zero to a high of 204 points. Scores of 46 or more are referred to the Bridges Home Visitation program.

As suggested above, home visitors performed two additional screenings. The first screening took place at approximately the third home visit, or within the first month of participation in the program. Typically the home visitors used information they gained during their routine assessments of the families to complete the screening tool. Such assessments are done as a natural part of the process of providing services to the family, thus the home visitors did not “interview” the family specifically to complete the screening tool.

The home visitors completed the screening tool one more time at the end of service to the family or at the end of one year of home visitation services, whichever came first. If the family dropped out of the program before successfully completing the service, the final screening was not completed, and the family was dropped from the analysis that considered the second evaluation question.

Presumably, early departures from the program could introduce bias into the remaining results by leaving behind only families with less or more risk. However, when data from the first home visitors’ screening were analyzed, no statistically significant risk level differences were observed between families for whom both home visitors’ screenings were available and those for whom only one screening was available. Thus the observation of no differences between the “first time” scores of families who completed the home visitation program and those that did not serves as evidence that no such bias resulted.

In addition to the compilation of data from the three quantitative screening scores, the evaluation team conducted a qualitative evaluation by interviewing 20 families who participated in the home visitation program. For this part of the evaluation, families were selected on the basis of their willingness to discuss their participation with an outside person. The discussants were recommended by their home visitors from among all the families in their caseload. The interviews were semi-structured and allowed the interviewees to let the responses guide additional questioning. The questions explored the participants’ views of the services they received, including what worked, what didn’t, and how useful the services were to them. The twofold goal of this portion of the evaluation was to learn whether and how much recipients of the home visitation services valued it and to learn in greater depth and detail how the program intervention played out in their families. Interviews were conducted at a location that was readily accessible to the families (either in their home or at another convenient site) and in the primary language spoken by the family member being interviewed. Results of the qualitative evaluation are included in a separate report to the Commission.

Quantitative Analysis Plan

The quantitative analysis addressed each of the evaluation questions specified above by testing two hypotheses, both with a dependent samples *t*-test:

- The screening scores resulting from the first in-home administration of the screening tool will be significantly higher than scores obtained while mothers were admitted to give birth.

- The final screening scores obtained at the completion of the intervention will be significantly lower than either the in-hospital scores or those obtained in the early weeks of home visitation.

If confirmed, the first hypothesis suggests that the level of need demonstrated in the hospital is indeed lower than that observed once a relationship has been established. If confirmed, the second hypothesis will support the claim that the home visiting intervention provided as part of the Bridges Program continues to be effective.

Quantitative Results

Although these results remain preliminary, they are based on a substantial number of families that have passed through the Bridges for Newborns program since data collection for the evaluation began. At this writing 320 hospital screenings and early home visitor screenings were available for the analysis, while 130 families had completed a final, one-year screening. Home visitation providers continue to submit completed screenings and a final report will be prepared after all screenings have been submitted.

Table 2. Distribution of Risk Scores While Admitted to Give Birth and at the First Home Visit (N=320)

| <i>Risk Factor</i> | <i>Percent at Risk Level Hospital Screening</i> | | <i>Percent at Risk Level Early Home Visit</i> | |
|--------------------------------------|---|-------------|---|-------------|
| | <i>Low/Mod</i> | <i>High</i> | <i>Low/Mod</i> | <i>High</i> |
| 1. Mother's Age | 62 | 16 | 59 | 18 |
| 2. Mother's marital status | 73 | 3 | 72 | 2 |
| 3. Number of other children in home | 72 | 2 | 63 | 4 |
| 4. Mother's use of English | 19 | 53 | 14 | 59 |
| 5. Mother's education | 20 | 79 | 21 | 78 |
| 6. Annual household income | 17 | 82 | 11 | 87 |
| 7. Adequate/timely Prenatal Care | 24 | 2 | 15 | 2 |
| 8. Health coverage (mom) | 84 | 4 | 74 | 12 |
| 9. Medical/Mental Health Problem | 23 | <1 | 21 | <1 |
| 10. Tobacco smoke in home | 24 | 1 | 12 | -- |
| 11. Current housing conditions | 84 | 1 | 70 | 1 |
| 12. Level of family support | 34 | 2 | 42 | 1 |
| 13. Transportation a barrier | 40 | 17 | 59 | 16 |
| 14. Adequate food in house | 32 | 1 | 43 | 1 |
| 15. Infant feeding issues | 74 | 3 | 58 | <1 |
| 16. Intent to provide well-baby care | 19 | 8 | 25 | <1 |
| 17. Mother's awareness of resources | 73 | 7 | 72 | 18 |
| 18. Strength of maternal bond | 12 | <1 | 23 | -- |
| 19. History domestic violence/abuse | 13 | 3 | 13 | 6 |
| 20. History of alcohol/drug use | 14 | 3 | 10 | 1 |
| 21. Infant coverage | 81 | 5 | 25 | 4 |
| 22. Infant source of medical care | 52 | 4 | 12 | 1 |
| 23. Infant medical problems | 10 | 4 | 8 | 2 |
| 24. Mother's worry re infant health | 25 | 3 | 34 | 4 |

Table 2 summarizes the percentage of these families who fell into the low-to-moderate or high risk category on each of the 24 risk screening items. As the table suggests, the ratings provided in the hospital and those provided during the early home visitation experience were not dissimilar. When a high-risk score was assigned, the most frequent reason was for a mother's low level of education or the family's low household income. The most frequent low-to-moderate risk scores were for lack of coverage (both mother and infant), current housing conditions, mothers' marital status and the number of other children in the home. Similarly, mothers in the sample tended to be at low-to-moderate risk on infant feeding issues and mother's awareness of available resources.

During the pilot evaluation a special analysis of several thousand similar screening scores determined that the screening tool's 24 items could be classified into six categories. The six categories and each of the screening tool items that make up the categories are shown in Table 3. Once the risk screening tools were computerized, each family's overall score was computed as was their score in each of the six special risk categories, and the two hypotheses for the evaluation were addressed for each of the seven resulting scores.

Table 3. Six Risk Categories Based on Factor Analysis of Bridges Pilot Data¹

| | |
|--|--|
| Category One: <u>Financial Resources</u> | Category Two: <u>Mother's Preparedness</u> |
| Mother's Coverage After Pregnancy (8) Child's Coverage After Birth (21) Household Income (6) Mother's English (4) Mother's Education (5) Current Housing (11) Transportation (13) Child's Medical Home (22) | Intent to get Care (16) Awareness of Resources (17) Maternal Bond (18) Plan for Infant Feeding (15) Adequate Food (14) |
| Category Three: <u>Family Strength</u> | Category Four: <u>Child's Health</u> |
| Family Support (12) Mother's Marital Status (2) Adequate Prenatal Care (7) Mother's Medical/Mental Health (9) | Mother's Worry about Child's Health (24) Child's Medical Problems at Birth (23) |
| Category Five: <u>Threats</u> | Category Six: <u>Experience and Demand</u> |
| History of Alcohol/Drug Abuse (20) Tobacco Smoke in Home (10) History of Domestic Violence/Child Abuse (19) | No/Many Other Children (3) Mother's Age (1) |

¹The number in parentheses shows the order in which the risk item appears on the screening tool.

The results for the first evaluation hypothesis are reported in Table 4. The first hypothesis examined whether or not risk levels were significantly higher when families were assessed by a home visitor after a trust relationship had been established. As seen in the table, significant differences were observed in the overall score and the financial resources score but not for any of the other areas. More importantly, the significant differences were in the opposite direction from that suggested in the evaluation hypothesis. The overall risk score and the financial resources risk scores produced by the home visitor were significantly *lower* than those resulting from the in-hospital assessment. Since no statistically significant differences were observed for any subcategory other than financial resources, it is presumed that the significant differences in the overall score can be attributed to an *overestimation* of risk due to financial circumstances on the part of the hospital staff who performed the assessment. It is likely the case that the birthing hospitals have less access to accurate financial information than home visitors. But these results also suggest that hospitals are doing almost as well in their limited time with families as home visitors do after several weeks and that an important concern—that families at risk could be missed because of short hospital stays—is less worrisome than the evaluation team formerly believed.

Table 4. Determining the True Level of Need: Home Visitors Will Find Higher Levels of Risk than Hospitals

| Risk Area (N) | Average Risk Score at Hospital Screen | Average Risk Score at First Home Visit | <i>t</i> -score | <i>p</i> -value |
|---|---------------------------------------|--|-----------------|-----------------|
| Overall Level of Risk (192) | 53.2 | 50.5 | 3.0 | .003 |
| Financial Resources (242) | 27.8 | 25.3 | 8.6 | <.001 |
| Mother's Preparation (241) | 6.7 | 6.8 | -0.5 | n.s. |
| Family Strength (240) | 5.3 | 5.4 | -0.3 | n.s. |
| Child's Health (257) | 1.7 | 1.6 | 0.6 | n.s. |
| Family Threats (234) | 3.8 | 3.6 | 0.6 | n.s. |
| Mother's Experience and Level of Demand (296) | 9.6 | 9.4 | 1.8 | n.s. |

The results for the second evaluation hypothesis are reported in Table 5. The second hypothesis assessed the effectiveness of the Bridges network of services by predicting that after one year, risk scores would show a statistically significant decrease. As the table suggest, the hypothesis is confirmed. Significantly improved (lower) risk scores were observed in the overall score as well as in all six subcategories of risk. Overall risk fell by 10 points on average, a decline of some 20 percent.

Table 5. Demonstrating the Continued Effectiveness of the Bridges Network of Services: Program Participation will Result in Significant Reductions in Risk

| Risk Area (N) | Average Risk Score at First Home Visit | Average Risk Score One Year Later | t-score | p-value |
|---|--|-----------------------------------|---------|---------|
| Overall Level of Risk (102) | 50.3 | 40.0 | 9.1 | <.001 |
| Financial Resources (117) | 25.0 | 22.7 | 6.0 | <.001 |
| Mother's Preparation (118) | 6.1 | 2.5 | 8.1 | <.001 |
| Family Strength (116) | 5.3 | 3.9 | 3.1 | .003 |
| Child's Health (120) | 1.7 | 0.9 | 3.2 | .002 |
| Family Threats (111) | 3.8 | 2.8 | 2.2 | .029 |
| Mother's Experience and Level of Demand (125) | 9.0 | 7.9 | 3.9 | <.001 |

Summary

Three risk assessments were performed by Bridges hospitals and home visitation service providers to evaluate the effectiveness of the Bridges for Newborns network of services. The evaluation addressed two questions:

- **What is the true level of need in the population referred to Bridges Home Visitation service providers?**

One of the continuing concerns of Bridges hospitals and home visitation providers is that there is insufficient time for hospital staff to develop a relationship of trust with a new mother while she is admitted to the hospital to give birth. Consequently, it is unclear whether the initial screening done by the hospital captures the family's true level of need and raises concern about whether families at risk are being missed. Thus, the evaluation hypothesized that risk levels assessed

during the hospital admission would be significantly higher once the family began to confide in the home visitor.

Preliminary findings suggested that hospitals and home visitation providers made very similar assessments of family risk, an overestimation of risk due to financial resources being the exception. In this case, hospitals rated the level of risk higher than home visitors. These findings suggest that home visitors find less risk, rather than more, after getting to know a family, and most importantly that hospital staff are doing an excellent job of locating and referring the right families for services.

▪ **Can the continuing effectiveness of the Bridges network of services be demonstrated?**

The Bridges pilot evaluation demonstrated the effectiveness of the new model over six months. However, the program is designed to provide home visitation services over the course of a year or more, depending on the family's needs. Therefore, this evaluation examines differences between screening scores obtained in the early weeks of home visitation to those obtained after one year or sooner if a family no longer required services. In this case, the evaluation hypothesized that risk levels would fall significantly over the service period. The preliminary findings demonstrated that significantly improved (lower) risk scores were observed in the overall score as well as in all six subcategories of risk. Overall risk fell by 10 points on average, a decline of some 20 percent. The Bridges network of services continues to demonstrate a high level of effectiveness as measured by significantly lower risk in the families it serves.

Although the sample size is large enough now to report statistically significant findings, the Bridges Home Visitation providers will continue to submit completed screening tools through February 2007, as families complete one year of the home visitation program. A final report will be prepared after all the data have been received and analyzed.