Harvesting the Scientific Investment in Prevention Science to Promote Children's Cognitive, Affective, and Behavioral Health: Workshop Summary

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Harvesting the Scientific Investment in Prevention Science to Promote Children's Cognitive, Affective, and Behavioral Health

Workshop Summary

Margie Patlak, *Rapporteur*

Forum on Promoting Children's Cognitive, Affective, and Behavioral Health

Board on Children, Youth, and Families

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This workshop summary has been reviewed in draft form by individuals chosen for their diverse perspectives and technical expertise, in accordance with procedures approved by the National Research Council's Report Review Committee. The purpose of this independent review is to provide candid and critical comments that will assist the institution in making its published workshop summary as sound as possible and to ensure that the workshop summary meets institutional standards for objectivity, evidence, and responsiveness to the study charge. The review comments and draft manuscript remain confidential to protect the integrity of the process. We wish to thank the following individuals for their review of this workshop summary:

Eric J. Bruns, University of Washington
Kelly Kelleher, Nationwide Children's Hospital and Ohio State University
Marguerita Lightfoot, University of California, San Francisco
Suniya Luthar, Columbia University and Arizona State University

Although the reviewers listed above have provided many constructive comments and suggestions, they did not see the final draft of the workshop summary before its release. The review of this workshop summary was overseen by **Elena Nightingale**. Appointed by the Institute of Medicine she was responsible for making certain that an independent examination of this workshop summary was carried out in accordance with institutional procedures and that all review comments were carefully considered. Responsibility for the final content of this workshop summary rests entirely with the rapporteur and the institution.

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Abbreviations and Acronyms

ACA	Patient Protection and Affordable Care Act
AHRQ	Agency for Healthcare Research and Quality
ASFA	Adoption and Safe Families Act
BIT	behavioral intervention technology
CBT	cognitive behavioral therapy
CDC	Centers for Disease Control and Prevention
CePIM	Center for Prevention Implementation Methodology
CMS	Centers for Medicare & Medicaid Services
EBI	evidence-based intervention
EBP	evidence-based practice
EBT	evidence-based treatment
HEDIS	Healthcare Effectiveness Data and Information Set
HHS	Department of Health and Human Services
IOM	Institute of Medicine
MAP	Managing and Adapting Practice
MHPAEA	Mental Health Parity and Addiction Equity Act
NIH	National Institutes of Health
NIMH	National Institute of Mental Health
NRC	National Research Council
NREPP	National Registry of Evidence-based Programs and Practices
PCORI	Patient-Centered Outcomes Research Institute
PFK	Partners for Kids
PREEMPT	Personalized Research for Monitoring Pain Treatment
PTSD	posttraumatic stress disorder
SAMHSA	Substance Abuse and Mental Health Services Administration
SMART	sequential, multiple assignment, randomized trial
SPARK	Supporting Partnerships to Assure Ready Kids
USPSTF	U.S. Preventive Services Task Force

1

Introduction[1]

Over the past few decades there have been major successes in creating evidence-based interventions (EBIs) to improve the cognitive, affective, and behavioral health of children. Many of these EBIs have been put into practice at the local, state, or national level, as was discussed in the Institute of Medicine-National Research Council (IOM-NRC) workshop summary *Strategies for Scaling Effective Family-Focused Preventive Interventions to Promote Children's Cognitive, Affective, and Behavioral Health* (IOM and NRC, 2014).

To reap what has been learned from such implementation, and to explore how new legislation and policies, such as the Patient Protection and Affordable Care Act (ACA) and the Mental Health Parity and Addiction Equity Act, as well as advances in technology and analytical methods can help drive future implementation, the IOM-NRC Forum on Promoting Children's Cognitive, Affective, and Behavioral Health held the workshop "Harvesting the Scientific Investment in Prevention Science to Promote Children's Cognitive, Affective, and Behavioral Health" in Washington, DC, on June 16 and 17, 2014 (see Appendix A, Workshop Statement of Task).

The goals of the workshop were to explore the following major questions:

1. How have existing scientific norms, implementation strategies, policies, and practices limited or provided impetus to quality care and improved outcomes for youth at the national, state, and local level? How should we adapt the current norms, strategies, and practices to facilitate broad adoption of prevention that will iteratively improve the quality of American families' lives over time?
2. What are key changes that will be needed in financing models, scientific models, policies, and implementation models within the sector in order to broadly implement evidence-based interventions (be the intervention a practice, program, principle, or strategy)?
3. What can be done to foster the creation of linkages across sectors (e.g., education, health care, child welfare, justice, and other sectors) to support the implementation and evaluation of preventive interventions for youth?

The workshop featured panel discussions of (1) system-level levers and blockages to the broad implementation of interventions with fidelity, focusing on policy, finance, and method science; (2) the role of scientific norms, implementation strategies, and practices in care quality and outcomes at the national, state, and local levels; and (3) new methodological directions (see

[1]The planning committee's role was limited to planning the workshop. The workshop summary has been prepared by the rapporteur as a factual account of what occurred at the workshop. Statements, recommendations, and opinions expressed are those of individual presenters and participants and are not necessarily endorsed or verified by the Institute of Medicine. They should not be construed as reflecting any group consensus.

Appendix B, Workshop Agenda.)[2] In addition, the workshop engaged forum members, workshop speakers, and attendees in breakout session discussions of facilitators and barriers to the broad diffusion of EBIs, building upon themes raised in the panel discussions, in the critical sectors of health care (including mental health care), schools and education, and child welfare and juvenile justice. On the second day of the workshop, the chairs of each of the three breakout groups presented summary reports of the themes that came up in their groups. The workshop also featured keynote presentations on (1) the role of economics and policy in scaling interventions for children's behavioral health, and (2) making better use of evidence to design informed and more efficient children's mental health systems.

ORGANIZATION OF THE WORKSHOP SUMMARY

This workshop summary is organized into five chapters, including this introduction. Chapter 2 describes new technologies and analytic methods that can aid effective dissemination and implementation of EBIs, as well as their quality improvement. Chapter 3 discusses strategies to overcome some of the barriers to wider implementation of EBIs for children, including the development of metrics, standards, and guidelines for implementation; integration of organizational and professional silos; and provision of more funding and support. Chapter 4 discusses innovative strategies and opportunities for funding implementation of evidence-based preventive interventions, such as forging public–private partnerships and applying new or underused funding. Chapter 5 summarizes themes from the workshop. Remarks from the breakout session discussions (described above) are woven throughout the report.

REFERENCE

IOM and NRC (Institute of Medicine and National Research Council). 2014. *Strategies for scaling effective family-focused preventive interventions to promote children's cognitive, affective, and behavioral health: Workshop summary*. Washington, DC: The National Academies Press.

[2]The Planning Committee was guided by the Statement of Task (SOT) when developing the workshop agenda. The topic of boundary challenges between existing and alternative diffusion strategies indicated in the SOT has been refocused to reviewing existing models for EBIs and emerging dissemination efforts.

2

New Analytic Methods and Technologies for Dissemination, Implementation, and Quality Improvement

The workshop featured presentations on new technologies and analytic methods that can aid effective dissemination and implementation of evidence-based preventive interventions, as well as their quality improvement. Some of these innovations enable the best use of multiple evidence-based interventions (EBIs) and tailoring of such interventions so they better suit the needs of their consumers, while others empower communities and organizations to run their own studies aimed at assessing if they are effectively implementing EBIs, and ways to improve that implementation.

MANAGING AND ADAPTING PRACTICE

Managing and Adapting Practice (MAP) is a knowledge management system with a direct service model that provides a way to develop and tailor an intervention based on research evidence, so that the intervention is best suited to the youth receiving it. This system, which was developed by Chorpita and Eric Daleiden from PracticeWise LLC, involves a feedback and local evidence component that involves real-time monitoring of progress during implementation and adapting practices appropriately because, as Chorpita noted, "Without being dynamic, we are not always going to succeed."

Chorpita and Daleiden developed MAP to coordinate and leverage both generalized knowledge, which stems from theory and randomized trials, and local knowledge, which is specific to the locale or even the individual for whom the intervention is implemented. Chorpita pointed out that often interventions are well suited for some but not all of the target population, and many have features that are not essential. "It's like if you go to buy a car and you only want one feature, but you have to get the other features you don't want because they are all bundled together. That is a bit how it felt when we were shopping for evidence-based programs in Hawaii," Chorpita said. He added that better guidance is needed for how to deliver the information needed to make real-time dynamic decisions, such as what intervention to implement when the one already implemented does not appear to be working.

MAP is a way to build treatment in a rational manner, Chorpita said. It is based on analyses Chorpita and his colleagues did on more than 700 randomized trials of EBIs for youths. From these analyses, they developed an easy-to-use automated system for culling EBIs relevant to the characteristics of the child being treated and showing which EBIs work best together for that individual. The system can then issue a one-page summary of information relevant to the planning and adapting of care for that child. The individual practices are represented as two-page "practice guides" that summarize how to implement the relevant EBI procedures (such as teaching problem-solving skills or adapting negative thinking). "Process guides" are also available, which outline how to piece the practices together when several are used as part of the treatment.

Chorpita's MAP system also has a clinical dashboard that shows the progress being made with a treatment while simultaneously showing the practice history, so practice can be appropriately adapted. Progress is rated based on assessments using locally relevant measures on a schedule that is tailored either to fit the child's presentation and/or the local system requirements.

A study that Daleiden, Chorpita and colleagues performed in Hawaii found that use of MAP was linked to rates of improvement that were more than twice that was achieved before the system was applied, with an effect size of 0.76 (Daleiden et al., 2006). The cost of MAP per client is about as much as an average EBI, but it serves multiple problems, Chorpita noted, so it can be applied with greater efficiency. A randomized trial of a modular treatment approach developed based on the MAP system but specifically for youth with anxiety, depression, or conduct problems, found significantly greater rates of improvement compared with providing either a standard EBI or usual care (see Figure 2-1) (Weisz et al., 2012).

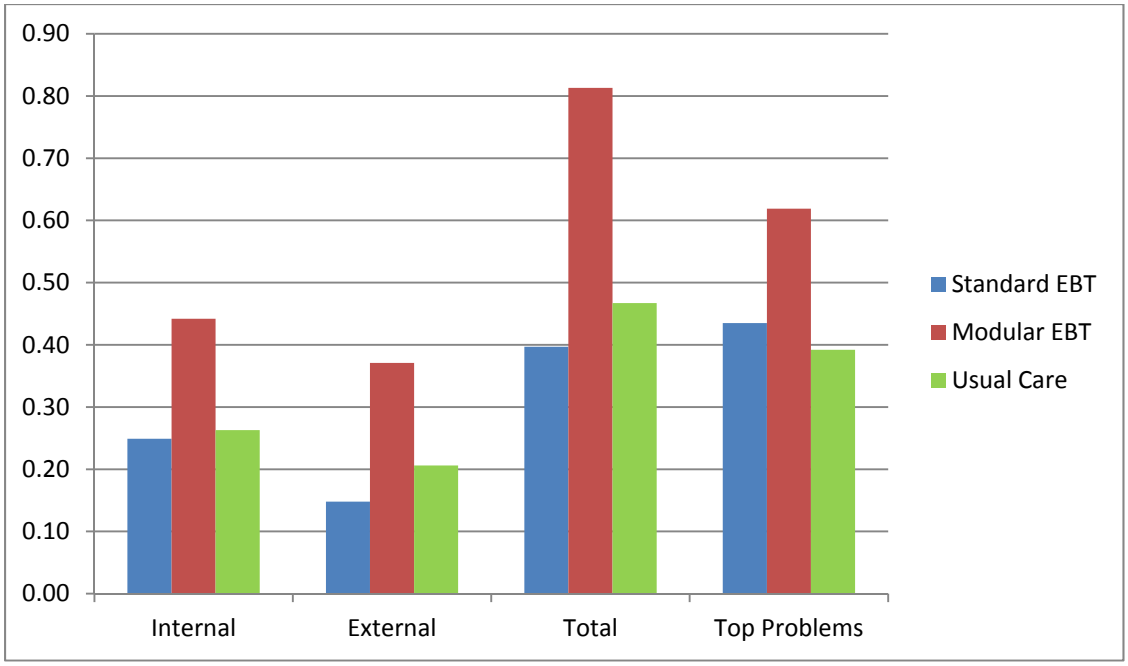

FIGURE 2-1 Rate of improvement on internal, external, and total symptoms, and family-nominated top problems, comparing standard and modular Evidence-based Treatments (EBTs) and usual care. SOURCE: Chorpita, 2014; adapted from Weisz et al., 2012.

Providers also expressed greater satisfaction when they used the modular system. "This kind of modular way of repackaging what we have seems to work better. It is guided, informed, and adaptive, so it lets you be dynamic and responsive when looking at youth's real-time outcome data," Chorpita said.

Chorpita is continuing to improve EBI treatment architecture by finding structured ways to respond to poor outcomes, poor engagement, change in treatment focus, comorbid interference, or other emergent problems. The need for such dynamic therapy was revealed by a study Chorpita conducted that found that 69 percent of cases had a client event, such as the death of a loved one or a school expulsion, that caused treatment to derail with no guidance on what should be done next (Chorpita et al., in press). After such events, providers were able to return to

the treatment program during the session only 20 percent of the time. Instead many tended to "go rogue," as Chorpita put it, and respond not based on any specific EBI. A study he did found that when a critical event is disclosed in session, only 33 percent of the time will a therapist use content from the protocol and attempt to relate it to the crisis. "We don't think this is good enough. If something goes wrong in the middle of a treatment encounter, we have not given providers the support that says 'Here's what you do in that situation,'" Chorpita said. He is currently applying for funding to study how to bring dynamic design down to the specific encounter level.

Chorpita summed up his presentation by saying, "We are never going to be able to predict all the things we need to do, so we need to think about exception management. It is not about more discovery, but rather, taking what we already have in our catalog and reorganizing it so we can be more efficient with it—extending, not replacing, what we have done so far." Later during discussion, Brent concurred with Chorpita noting that, "When we were developing a treatment for suicidal kids that was very structured, the therapist would come back to supervision and say 'Our kids' problems keep getting in the way of our ability to deliver treatment.' That is a real problem."

In response to a question of a participant on how relevant the MAP system is to children with disabilities, Chorpita noted that his analyses found that EBIs designed for different populations, such as children in foster care, those in the juvenile justice system, and those with developmental disabilities, tended to use some of the same basic elements. "There is a finite set of things we do that help children, whether they are delivered by a soccer coach, a schoolteacher, or a therapist at a clinic. What we are looking at now is how to put more interfaces around that knowledge base so people who encounter kids with any kind of problem are in a position to take informed action and have a therapeutic influence on the child's life."

Chorpita added, "We need to be talking across literatures and organizations and across populations of kids. It is time to build those translations. We have discovered most of the answers, and we need to figure out how to put them in the hands of all these different people."

Bruns concurred, noting in his presentation that he has been trying to infuse common elements and factors of evidence-based practice into real-world systems in schools by using Chorpita's MAP and wrap-around coordinated care. He noted that care coordinators rated the usefulness of the Web-based MAP resources Chorpita has developed almost as highly as did therapists.

Bruns added that public systems, such as state departments of child welfare and juvenile justice, are amenable to applying behavioral health Evidence-Based Practices (EBP) if they focus on the outcomes important to those systems. He has been working with the Washington State Children's Administration to implement for child welfare applications a suite of behavioral EBIs, including The Incredible Years®, which was originally designed for school systems, as well as more traditional child welfare prevention interventions such as SafeCare.

Recognizing the importance of providing infrastructure support for implementers of EBIs, including implementation strategies, Bruns and his colleagues developed a Web-based guidance tool for social workers to pick the right EBI based on the characteristics of the child they are working with, as well as a readiness assessment, so they can choose providers able to implement the EBI, and enhancements to the existing suite of EBIs, such as cross-EBI motivational enhancement training. The researchers also developed a standardized cross-intervention fidelity monitoring strategy that provides consistent information needed to manage comprehensive implementation of eight EBIs for a statewide child welfare system. This

information included how adequate referrals were, and provider compliance and competence (see Box 2-1).

BOX 2-1
Examples of Strategies and Products to Support a Multi-EBI Public System Improvement Rollout

- A unified approach to EBP fidelity supports and monitoring
- The **Guidance Tool**
  - Detailed set of EBP referral guidelines for use by California social workers
- The **Toolkit**—Provider fidelity tracking database using consistent categories
  - Facilitates compliance and provision of technical assistance
- Structured EBP **readiness assessment**
  - Used by Children's Administration regional staff during contract negotiations
- EBP **Staff Selection Guide**
  - Pretraining agreement signed by provider agency representative in advance of EBP training
- **Enhancements** to existing suite of EBPs
  - For example, motivational enhancement training
- **Data analysis and use of information** to inform programming
  - For example, differential rates of EBP use across regions

SOURCE: Bruns, 2014.

STUDY DESIGNS

Naihua Duan, retired Professor of Biostatistics in Psychiatry from Columbia University, reported on new study designs that have emerged in recent years to help tailor EBIs more appropriately to the population in which they are implemented and go beyond the standard, two-armed randomized controlled trials, in which an intervention is tested compared to usual care without the intervention.

Factorial trials can test multiple components of an intervention, treatment, or prevention program, or an implementation strategy. Testing multiple components simultaneously enables understanding of a how to optimize them, and reveals which are core elements that must be part of the intervention or implementation strategy versus elements that can be optional (Chakraborty et al., 2009; Collins et al., 2005, 2007a,b, 2011), Duan said.

Conjoint analyses are factorial trials embedded in surveys of potential consumers for a hypothetical intervention or implementation strategy. For these analyses, researchers devise hypothetical variations of the intervention and ask consumers to rate or rank them. Their answers are used to determine the ultimate design of an intervention or implementation strategy (Green and Srinivasan, 1978; Lee et al., 2012).

Another type of design, sequential, multiple assignment, randomized trial (SMART), can be used to develop and evaluate adaptive treatment strategies (Chakraborty and Murphy, 2014; Collins et al., 2007; Murphy, 2003, 2005). With an adaptive treatment strategy, an individually customized sequence of treatments is delivered. When one treatment fails for a specific patient,

the next treatment in sequence is delivered. SMART evaluates a variety of candidate adaptive treatment strategies to identify the optimal strategy for subsequent implementation.

David Mohr, Director of the Center for Behavioral Intervention Technologies at Northwestern University, added that SMART trials could also be useful in identifying which subpopulations need more intensive and thus more expensive interventions, enabling the bulk of the population to initially receive lower-cost care. "You can think of it not just from an outcomes perspective, but also in terms of cost-effectiveness," Mohr said.

Duan also reported on mixed methods, which integrate qualitative and quantitative techniques. Mixed methods can be especially useful for studies with multiple objectives, such as studies on implementation, dissemination, and quality improvement, he said (Green et al., 2014; Palinkas et al., 2013). A typical study design would test a primary aim, but with implementation and dissemination, there are multiple aims that are all important and should be considered simultaneously, Duan noted. These multiple aims can drive different study designs. Optimal design and purposeful sampling is a mixed methods study design aimed at achieving a compromise across different methods, according to Duan (Palinkas et al., 2013).

Later in the discussion, Duan emphasized the importance of providing technical assistance in methodology as part of the infrastructure development for prevention programs, including statistical methods and technology that can enable evaluations in local communities. "There needs to be some level of technology-based infrastructure development that will allow us to empower the local community to do the kind of evaluation using local data that might be useful to inform adaptation," he said. Such infrastructure could also be useful at state and federal levels.

As Duan made clear, ownership of technology is increasingly being distributed across the population at large, enabling customization of objectives and procedures such that "It is possible to do things that might not have been thinkable 10 or even 5 years ago." He pointed out that schools and service agencies have the potential to use the hardware and software they already have for their own data entry, management, processing, and analysis, which could aid implementation and dissemination; however technical assistance is needed in order for this potential to materialize. "This is a way to mitigate the methodology, in particular, statistics, as a barrier," Duan said, as there often is a need for local investigations to address local issues. Palinkas added that a critical part of community-based participatory research is the methodology that can enable research-practice partnerships to work at the locales where EBIs are implemented.

Local can mean at the school or agency level but also at the individual level. Duan and colleagues (Richard Kravitz, Chris Schmid, and Ida Sim) have been developing the technology and statistical infrastructure for the Personalized Research for Monitoring Pain Treatment (PREEMPT) study[1] to facilitate the implementation of single-patient trials, which could be a useful implementation tool for individualized decision making for clinical treatments (Duan et al., 2013; Kravitz and Duan, 2014). He noted the same methodology used in PREEMPT could be used to conduct single-agency or single-school trials. In these trials, the individual patient, school, or agency tests out different interventions in a systematic fashion such that there is balanced assignment of time intervals, and repeated outcome assessments at least once per time period.

[1]More information about the PREEMPT study can be found at http://www.ucdmc.ucdavis.edu/chpr/preempt (accessed October 24, 2014).

Duan explained that essentially, the entity implementing the intervention acts as its own control group. For example, the outcome can be compared between the time periods during which a school implements one EBI versus the other time periods during which the same school did not use the EBI or used a different EBI. "We often don't know whether the new procedure is going to be much better than the existing procedure for the specific locale, and in these situations such a local investigation can be helpful," Duan noted. Duan and colleagues are currently developing apps on Android devices for clinicians and patients to use to design single-patient trials and to implement the trials and collect the data in the PREEMPT study. Such apps could also be adapted to facilitate the infrastructure needs for prevention programs for youth, he said.

"This methodology development hopefully will stimulate more local investigations that use empirical approaches, and it will empower local organizations to use their own data to address their own questions, which might be a way to help generate buy in," Duan said. Brown agreed, noting, "Every community I have gone to claim they are unlike everybody else," so a program tested elsewhere will not necessarily work for them. But giving these communities the opportunity to conduct their own trials is likely to engage them more "as opposed to doing something deliberate to the community that they do not necessarily want," Brown said.

Mohr added that adaptive or single-entity trials "give us the opportunity to examine outcomes in real time and in real use," while preserving randomization and other benefits of controlled trials that enable collection of nonbiased information. He envisions agencies curating and making these interventions available, and then continuously monitoring the results of their implementations in real-world settings. "Like an open-panel horse race, when those applications demonstrate locally that they are not as effective as others, they can essentially be dropped from the system, leaving those remaining to prove whether they are worthy." Interventions could be added over time into the system, whose continuous monitoring would be akin to postmarketing surveillance, which provides data while protecting the interest of consumers and payers, Mohr said.

BEHAVIORAL INTERVENTION TECHNOLOGY

Mohr gave a presentation on behavioral intervention technology (BIT), which involves using mobile phones, tablets, computers, and sensor data to promote behavior change in support of health, mental health, and wellness. He noted that BITs got off the ground about 10 to 15 years ago when Web-based interventions such as MoodGYM were first developed. This online, interactive program uses principles of cognitive behavioral therapy and relaxation and meditation techniques to prevent and help individuals cope with depression (MoodGYM, 2014). MoodGYM consists of several modules, including an interactive game, anxiety and depression assessments, a downloadable relaxation audio file, and a workbook and feedback assessment. There is no coaching component. A study of the benefits of a MoodGYM delivered as a part of a high school curriculum (N = 157) found that adolescents who were randomized to use MoodGYM experienced a significantly faster rate of decline in depressive symptoms compared with students randomized to usual curriculum. The effect size for MoodGYM was not significant immediately after the intervention, but was moderate and significant 20 weeks after the intervention. However, there were no significant intervention effects on depression status, attributional style, depression literacy, and attitudes (O'Kearney et al., 2009). "We see this a lot—simply providing these Web-based interventions to people often does not work," Mohr said.

Text messaging is another BIT used frequently in youth-targeted prevention programs, Mohr reported. Although generally well accepted, a systematic review did not find consistent improvement in complex health behaviors, such as physical activity or smoking cessation, when text messaging prevention programs are applied, although they are useful for providing reminders for simple behaviors, such as taking a medication and going to appointments (Preston et al., 2011).

Smartphone applications have recently blossomed, with an estimate of about 40,000 health apps available in app stores, including more than 2,000 apps for specific health conditions, Mohr reported. "The good news is that most of them are free. The bad news is that most of them are of extremely poor quality, and there is no clear evidence base for them," Mohr said. One study of an eatery app aimed at supporting diet changes in adults found that although there were nearly 200,000 downloads of the app, 86 percent of those downloads were never used, and less than 3 percent of consumers used the application more than 10 times (Helander et al., 2014).

"My take-home point is that technology is great, but humans really are important," Morh stressed. He noted a study (Mohr et al., 2013) that found that coach-supported Web-based interventions had significantly more logins than stand-alone Web treatments (Cuijpers et al., 2009; Richards et al., 2012). Such coach support can involve brief, 10- to 15-minute phone calls or text messages, and therefore does not require a lot of time on the part of the therapist, Mohr noted.

Mohr explored the scientific literature to develop a model for what type of coaching or support is the most effective in improving adherence to Web-based interactions. He developed a coaching model aimed at improving adherence, called supportive accountability (Mohr et al., 2011). The basic principal of supportive accountability is that users are more likely to be adherent to a behavioral intervention technology if they have clear use goals, and they know they will be communicating with a coach about whether or not they met those use goals. The value of this coaching is increased if users have a good therapeutic bond with the coach, and views the coach as benevolent (having their best interests at heart) and competent. Motivation of participants also influences adherence and is variable. Users who are more intrinsically motivated likely need less coaching, while those who are externally motivated may require more. A third influence on adherence is communication bandwidth. Some forms of communication are wider, meaning they enable more types of non-verbal information to be conveyed, Mohr pointed out. When there is in-person communication there are visual and voice cues, in addition to the information conveyed, whereas communication via messaging lacks these cues. Surprisingly, researchers found it is the latter, leaner form of communication that can provide stronger relationships, especially initially, because people tend to make positive inferences in the absence of information. However, if there is a breach in the relationship, richer communication channels are required to repair the relational difficulties.

Using this information, Mohr developed a model that he tested and found worked well, he said (Mohr et al., 2011, 2013). He then applied the supportive accountability model by developing computer interventions embedded in automated peer networks that display features for support and accountability, such as interventions that display information about when people were last logged in and what their activity was (Duffecy et al., 2013). Then when users have not logged in frequently enough, they receive emails stating that somebody in their group is missing them and they should come back. "We are providing people with what they need to hold each other accountable," Mohr said. There also is a comments feature, which creates community and also displays accountability.

When Mohr tested one of his BIT interventions, which aims at preventing depression in youth, he found over a 10-week period, users had a mean of 24 logins, which is a very high login rate for a Web-based intervention, according to Mohr. In response to usability testing, Mohr is rebuilding his intervention so it can be used on mobile devices. "Not surprisingly, kids want this on a mobile device, and they want text messages not emails," Mohr said (see Figure 2-2). Mohr also modified his Web-based system so it can be used in a mobile app to prevent depression in cancer survivors. Initial tests of this app found that it increased improvement in mood and reduced users' degree of depression more so than peer support (Duffecy et al., 2013).

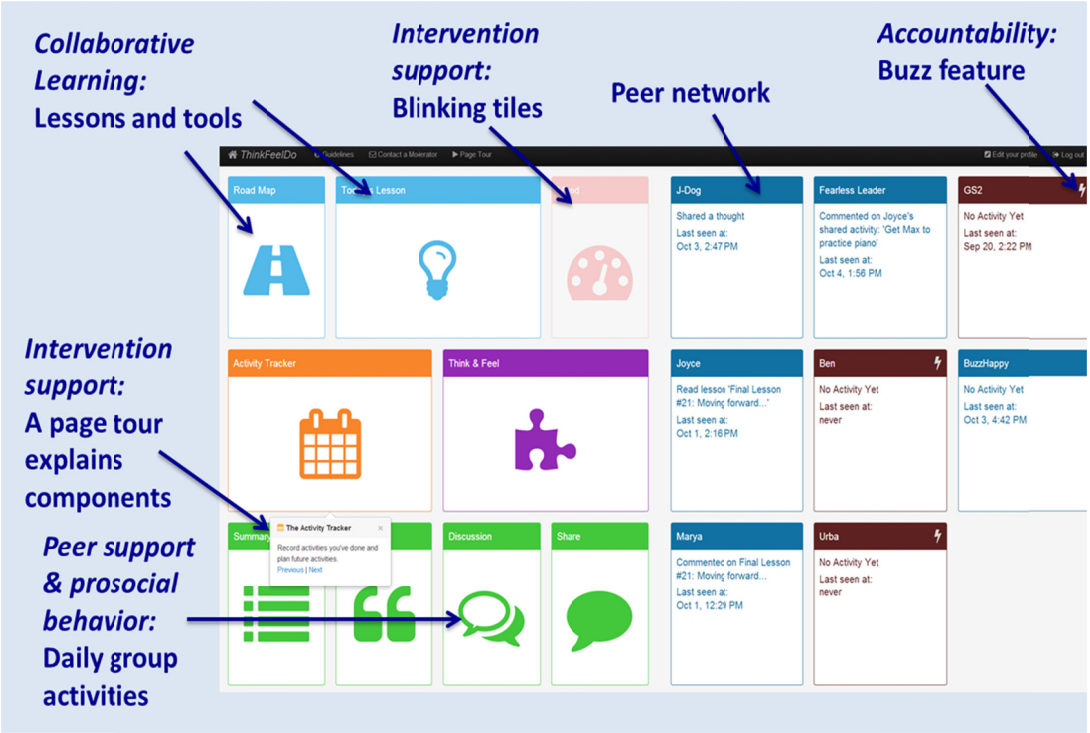

FIGURE 2-2 Peer networked Web-based intervention for depression.
SOURCE: MOHR, 2014.

Given the results he has had so far, Mohr stressed devising an appropriate system in which a BIT is used that provides the proper support for the technology. "I don't think we can just put an app on the app store and expect that kids will download and use it effectively. We need to think more deeply about how these are going to be embedded in systems," Mohr said.

Mohr also talked about the need to make technologies more user-friendly and easier to use, which includes creating intelligent systems that can use sensor data from mobile phones to understand the context in which users are. "We want to fit our interventions into the fabric of people's lives. People take their cellphones with them, and a lot of data can be collected from cellphones," he said. That data includes location, motion, social activity (such as texts, phone calls, and emails), use of apps and browsers on the phone, and other data, such as what the weather currently is like in the environs of the user. A lot of Mohr's work now is focused on using sensors and cellphones to detect whether users are at a place of entertainment, work, or at a friend's home, what they are doing, whether they are alone, their sleep patterns, what their emotional state is, and whether they are keeping their appointments. He is using this information

to develop behavioral interventions that positively reinforce desired behavior and offer suggestions for improving other behavior, as well as provide information for clinicians.

But Mohr noted it takes a long time to develop and test BITs—a time frame not well suited for digital devices, which tend to evolve swiftly. Thus, applications that use digital technologies may have relative short lifespans. He called for having rapid evaluation models that fit into the timeline of technological development. He suggested not testing more apps for validation, as one would a pharmaceutical, but instead evaluating principles for how apps should be designed and implemented, thereby producing knowledge that can be more broadly applied. He also suggested eliminating the idea that applications should be "locked down" during evaluation, since the natural state of apps is that they are continually evolving. Mohr also noted that knowledge about programming and developing apps is not transmitted across investigators. "Everybody is developing the same thing, nobody gets it right the first time, but we are not sharing our lessons," Mohr emphasized. He described the Purple Development Environment as a model in which components such as logging tools, content delivery, visualizations, notification tools, and sensor data collection are developed in a modular and extensible manner, allowing them to be repurposed and refined across applications (Schueller et al., 2014).

REFERENCES

Bruns, E. J. 2014. *Big thinking from small science: Promoting coordinated action to build knowledge-informed systems for youth and families*. Presented at IOM and NRC Workshop on Harvesting the Scientific Investment in Prevention Science to Promote Children's Cognitive, Affective, and Behavioral Health.

CBITS (Center for Behavioral Intervention Technologies). 2014. *Peer networked Web-based intervention for depression*. http://cbits.northwestern.edu/#! (accessed September 8, 2014).

Chakraborty, B., and S. A. Murphy. 2014. Dynamic treatment regimes. *Annual Review of Statistics and Its Applications* 1:447-464.

Chakraborty, B., L. M. Collins, V. J. Strecher, and S. A. Murphy. 2009. Developing multicomponent interventions using fractional factorial designs. *Statistics in Medicine* 28(21):2687-2708.

Chorpita, B. F. 2014. *Putting more evidence in evidence-based practice: Designing informed and efficient children's mental health systems*. Presented at IOM and NRC Workshop on Harvesting the Scientific Investment in Prevention Science to Promote Children's Cognitive, Affective, and Behavioral Health.

Chorpita, B. F., P. Korathu-Larson, L. Knowles, and K. Guan. (in press). Emergent life events and their impact on service delivery: Should we expect the unexpected?" *Professional Psychology: Research and Practice.*

Collins, L. M., S. A. Murphy, V. N. Nair, and V. J. Strecher. 2005. A strategy for optimizing and evaluating behavioral interventions. *Annals of Behavioral Medicine* 30(1):65-73.

Collins, L.M., S. A. Murphy, and V. Strecher. 2007. The multiphase optimization strategy (MOST) and the sequential multiple assignment randomized trial (SMART): New methods for more potent eHealth interventions. *American Journal of Preventive Medicine* 32(5 Suppl):S112-S118.

Collins, L. M., T. B. Baker, R. J. Mermelstein, M. E. Piper, D. E. Jorenby, S. S. Smith, B. A. Christiansen, T. R. Schlam, J. W. Cook, and M. C. Fiore. 2011. The multiphase optimization strategy for engineering effective tobacco use interventions. *Annals of Behavioral Medicine* 41(2):208-226.

Cuijpers, P., I. M. Marks, A. van Straten, K. Cavanagh, L. Gega, and G. Andersson. 2009. Computer-aided psychotherapy for anxiety disorders: A meta-analytic review. *Cognitive Behavioral Therapy* 38(2):66-82.

Daleiden, E. L., B. F. Chorpita, C. M. Donkervoet, A. A. Arensdorf, and M. Brogan. 2006. Getting better at getting them better: Health outcomes and evidence-based practice within a system of care. *Journal of the American Academy of Child and Adolescent Psychiatry* 45:749-756.

Duan, N., R. L. Kravitz, C. H. Schmid. 2013. Single-patient (N-of-1) trials: A pragmatic clinical decision methodology for patient-centered comparative effectiveness research. *Journal of Clinical Epidemiology* 66(8 Suppl):S21-S28.

Duffecy, J., S. Sanford, L. Wagner, M. Begale, E Nawacki, and D. C. Mohr. 2013. Project Onward: An innovative e-health intervention for cancer survivors. *Psychooncology* 22(4):947-951.

Green, C. A., N. Duan, R. D. Gibbons, K. E. Hoagwood, L. A. Palinkas, and J. P. Wisdom. 2014 [Epub ahead of print]. Approaches to mixed methods dissemination and implementation research: Methods, strengths, caveats, and opportunities. *Administration and Policy in Mental Health*.

Green, P. E., and V. Srinivasan. 1978. Conjoint analysis in consumer research: Issues and outlook. *Journal of Consumer Research* 5(2):103-123.

Helander, E., K. Kaipainen, I. Korhonen, and B. Wansink. 2014. Factors related to sustained use of a free mobile app for dietary self-monitoring with photography and peer feedback: Retrospective cohort study. *Journal of Medical Internet Research* 16(4):e109.

Kravitz, R. L., and N. Duan editors. 2014. *Design and implementation of N-of-1 trials: A user's guide.* AHRQ Publication No. 13(14)-EHC122-EF. Rockville, MD: Agency for Healthcare Research and Quality. Available from: http:// www.effectivehealthcare.ahrq.gov/N-1-Trials.cfm (accessed September 25, 2014).

Lee, S. J., P. A. Newman, W. S. Comulada, W. E. Cunningham, and N. Duan. 2012. Use of conjoint analysis to assess HIV vaccine acceptability: Feasibility of an innovation in the assessment of consumer health-care preferences. *International Journal of STD and AIDS* 23(4):235-241.

Mohr, D. C. 2014. *Behavioral intervention technologies for depression in youth*. Presented at IOM and NRC Workshop on Harvesting the Scientific Investment in Prevention Science to Promote Children's Cognitive, Affective, and Behavioral Health.

Mohr, D. C., P. Cuijpers, and K. Lehman. 2011. Supportive accountability: A model for providing human support to enhance adherence to eHealth interventions. *Journal of Medical Internet Research* 13(1):e30.

Mohr, D. C., J. Duffecy, J. Ho, M. Kwasny, X. Cai, M. N. Burns, and M. Begale. 2013. A randomized controlled trial evaluating a manualized TeleCoaching protocol for improving adherence to a Web-based intervention for the treatment of depression. *PLoS ONE* 8(8):e70086.

MoodGYM. 2014. The MoodGYM training program. https://moodgym.anu.edu.au/welcome (accessed September 8, 2014).

Murphy, S. 2003. Optimal dynamic treatment regimes (with discussion). *Journal of the Royal Statistical Society, Series B* 65(2):331-366.

Murphy, S. A. 2005. An experimental design for the development of adaptive treatment strategies. *Statistics in Medicine* 24(10):1455-1481.

O'Kearney, R, K. Kang, H. Christensen, and K. Griffiths. 2009. A controlled trial of a school-based Internet program for reducing depressive symptoms in adolescent girls. *Depression and Anxiety* 26(1):65-72.

Palinkas, L. A., S. M. Horwitz, C. A. Green, J. P. Wisdom, N. Duan, and K. Hoagwood. 2013 [Epub ahead of print]. Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and Policy in Mental Health and Mental Health Services Research.*

Preston, K. E., T. A. Walhart, and A. L. O'Sullivan. 2011. Prompting healthy behavior via text messaging in adolescents and young adults. *American Journal of Lifestyle Medicine* 5(3):247-252.

Richards, D., and T. Richardson. 2012. Computer-based psychological treatments for depression: A systematic review and meta-analysis. *Clinical Psychology Review* 32(4):329-342.

Schueller, S. M., M. Begale, F. J. Penedo, and D. C. Mohr. Purple: A modular system for developing and deploying behavioral intervention technologies. *Journal of Medical Internet Research* 16(7):e181.

Weisz, J. R., B. F. Chorpita, L. A. Palinkas, S. K., Schoenwald, J. Miranda, S. K. Bearman, E. L. Daleiden, A. M. Ugueto, A. Ho, J. Martin, J. Gray, A. Alleyne, D. A. Langer, M. A. Southam-Gerow, R. D. Gibbons, and the Research Network on Youth Mental Health. 2012. Testing standard and modular designs for psychotherapy treating depression, anxiety, and conduct problems in youth: A randomized effectiveness trial. *Archives of General Psychiatry* 69(3):274-282.

3

Overcoming Barriers

The workshop explored several ways to overcome the barriers to wider implementation of evidence-based preventive interventions for children, including developing metrics, standards and guidelines for implementation; integrating organizational and professional silos; and providing more funding—and support for evidence-based interventions (EBIs) and their implementation.

DEVELOPING METRICS, STANDARDS, AND GUIDELINES

Several presenters and participants in breakout groups emphasized the importance of developing the appropriate metrics, standards and guidelines for desired outcomes to ensure preventive EBIs are appropriately applied, and to help make the business case for such interventions.

Appropriate Goals, Measures, and Outcomes

Samuels pointed out that a major flaw in the Adoption and Safe Families Act (ASFA) of 1997 was its lack of appropriate goals and outcome measures. The main principles of that law, as Samuels outlined it, were:

- Safety of children is the paramount concern that must guide all child welfare services.
- Foster care is a temporary setting and not a place for children to grow up.
- Permanency planning efforts should begin as soon as a child enters the child welfare system.
- The child welfare system must focus on results and accountability.

But the results the system focused on were not appropriate, according to Samuels. Because of this reform in child welfare, there was a significant drop in the overall size of the foster care population, which has been touted as showing that the law was successful. That drop was mainly due to a combination of adoptions and keeping more children at home. But "the legislation didn't speak to the social and emotional wellbeing of a child or to the EBIs needed to achieve that," Samuels pointed out. "The operationalization of that policy didn't require that children actually be served effectively in order to get them out of the [foster care] system."

Samuels noted that conformity with federal child welfare requirements (e.g., maltreatment investigations, removal of children from biological home, caseworker visits, training and monitoring of foster parents) does not necessarily improve clinical outcomes of children. He added that many children in the out-of-home care system have clinical-level needs due to social and emotional issues, and many of these children also have physical health conditions. "What happens to children before they come into the system has to be connected with what happens to them when they are in the system," Samuels said. But according to Samuels, most state Medicaid agencies will not pay for the complex care required to treat children who

have experienced maltreatment prior to foster care. In most states, children are required to have a diagnosis of mental illness before Medicaid will pay for behavioral health interventions.

Samuels stressed that state agencies tend to purchase or reimburse services but not the outcomes EBIs are designed to achieve. “They know how to purchase a unit of service but purchasing a unit of outcome is a significantly different challenge, and building the procurement capacity to do that is critical to succeeding,” Samuels said. Similarly, other participants noted that many health care performance measures are for processes followed and not outcomes achieved in the target population. Kelleher suggested there be standard outcome measures for children that can guide what accountable care organizations have to do for children and that Medicaid directors would accept as valid. Many proposed outcome measures and accountability measures for adults exist, but no such standards for accountable care currently address pediatrics.

Samuels pointed out that there has been limited interest or energy focused on how to standardize outcome measurements. Common understanding about what successes are, and standardized outcomes to measure those successes, will enable child welfare agencies across all states to meet their obligations, Samuels said. Dr. Bruns added, “We need more guidance that would help us measure similar things that matter across states.” He noted that the Healthcare Effectiveness Data and Information Set (HEDIS), a tool used by the private insurance industry as well as by Centers for Medicare & Medicaid Services to assess performance on measures of health care, currently includes only a few measures of behavioral health in children. Bruns went on to state “We’re not asking states to report consistently even about penetration rates and what kinds of services are being delivered, so we have no basis for understanding what strategies seem to be working. Even just that kind of consistency and expectations of measurement around real world things we’re trying to achieve would be a huge step.”

Frank suggested that there be broad measures to indicate whether a program is working, as well as a tiered approach to quality measurement such that if a simple indicator suggests possible failure, then there would be a different level of scrutiny requiring collecting more data. If that second level of scrutiny also indicated failure then the system would undergo a detailed audit.

Members of the health care breakout group discussed the importance of measurement and having appropriate metrics at the planning and implementation stages for EBIs, including metrics that can provide feedback on how well a program is being implemented. Several group participants suggested that the outcomes that are measured within a system be developmentally appropriate at different stages of a child’s life. Members of the group also thought it would be beneficial if the data collected on outcomes fit the needs of stakeholders, such as state Medicaid directors or managed care organizations, and that metrics development start by focusing on outcomes shared over the several sectors overseeing the welfare of children.

Another measurement issue that needs to be addressed is that often researchers and state agencies use inappropriate metrics when assessing the value of an EBI because they rely on effect size instead of reach, Bruns pointed out. The population impact of an intervention depends on two factors: what proportion of the full population at risk receives the intervention (reach) and how large a reduction in risk (effect size) occurs among those who receive it (Zatzick et al., 2009). Some interventions may have large effect sizes, but their reach is small such that another intervention with a smaller effect size but a larger reach can have a greater impact on the population of interest.

Bruns suggested combining measurements of the target population, effect size, and reach to assess the overall population impact of a prevention intervention. He discussed one study of

two preventive interventions for posttraumatic stress disorder (PTSD). Although the target population was the same when both were applied, one had a much bigger effect size than the other. But the latter one, even though it had an effect size of only 10 percent, was able to prevent 10 times more cases of PTSD because it did not have as many barriers to uptake and retention, including cost factors and exclusion criteria (Zatzick et al., 2009) (see Figure 3-1). "We should replace effect size as the metric we're looking for in our programs with capacity to reach as many individuals as possible," Bruns said. Collins concurred and suggested considering the actual reach versus the potential reach of an EBI, and if there is insufficient reach, consider discontinuing the program and applying a different one.

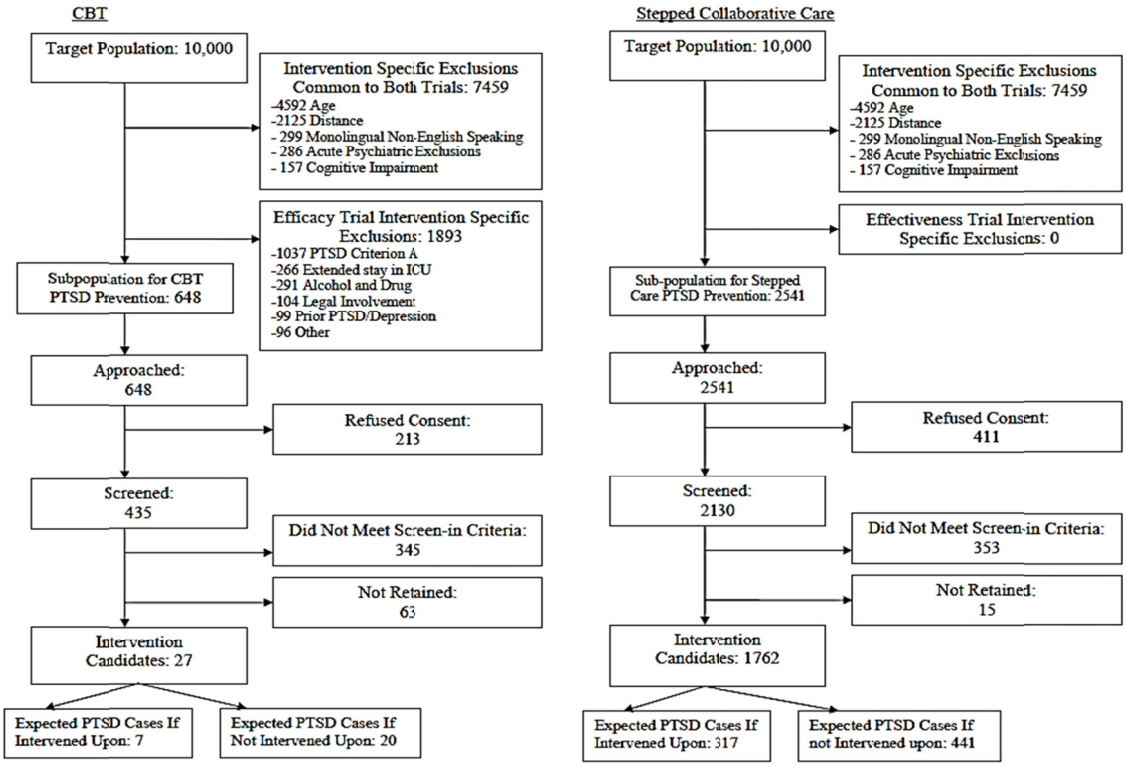

FIGURE 3-1 Program "reach" vs. effect size.
NOTE: Projected cognitive behavioral psychotherapy (CBT) and stepped collaborative care flow diagrams specifying target populations for PTSD prevention.
SOURCE: Zatzick et al., 2009, reprinted with permission.

There is a lack of specific standardized quality metrics for behavioral health that can be used in multiple sectors, several participants pointed out, as well as metrics for effective parenting. But members in the schools breakout group noted that there are a number of well-accepted measures for children's behavior and academic achievement that could be more widely applied. "If you added psychological well-being to those measures, you would have a pretty good profile that would be useful for juvenile justice or for any other enterprise," Sheppard Kellam of Johns Hopkins Bloomberg School of Public Health said. He suggested these metrics could serve as proximal measures for employment rates and other outcomes that occur later in young adulthood.

Members of the health care breakout group also concurred with the suggestion of some of the presenters that better metrics need to be developed in order to make the business case for preventive interventions, given that often prevention has long-term gains. Participants in the group suggested considering proximal measures that will predict the long-term health measures that will follow, and that all measures used be specific to context, publically available, understandable and easy to use, actionable, and developmentally appropriate for the stage of life one is trying to optimize.

Some child welfare and juvenile/family justice breakout group members also emphasized the importance of having metrics that can reveal the return in investment made from a prevention EBI. Larry Palinkas of the University of Southern California School of Social Work, noted that in the adult realm there are economic measures, such as quality-adjusted life years, which is a component of the Quality of Well-Being Scale, but there is no comparable scale for prevention in children and youths, and he suggested focusing on developing one. He added that the National Institute on Drug Abuse, which funds the community youth development study, has shown that there is a return of $5 for every $1 invested in youth prevention, and that a similar calculation could be followed to figure return on investments for other prevention programs.

Members of the health care breakout group suggested there could be greater use of existing measures, such as those used in the National Institutes of Health (NIH) Toolbox, which is a multidimensional set of brief measures assessing cognitive, emotional, motor, and sensory function in individuals age 3 to 85 and that meets the need for a standard set of measures that can be used as a "common currency" across diverse study designs and settings (NIH Toolbox, 2014). Although these measures have been deployed in health settings and to some degree in mental health settings, they have not necessarily been used as often in juvenile justice, foster care, and child welfare, David Chambers, National Institute of Mental Health, noted. "Is there a way that, in a cross-sector fashion, we can try and bridge these different measures of health and of mental health in these other settings?" he asked.

Practice Recommendations

Along with metrics and standards, some participants suggested there be more official sanctioning of prevention EBIs so they are more readily adopted and funded. A well-respected organization that provides recommendations regarding preventive services to be provided in primary care settings is the U.S. Prevention Services Task Force (USPSTF), which is supported by the Agency for Healthcare Research and Quality (AHRQ). Alex Kemper of Duke University School of Medicine who is a member of the USPSTF reported on how the Task Force makes its recommendations and how those recommendations are graded according to evidence quality. (See Box 3-1.)

BOX 3-1
U.S. Preventive Services Task Force Grading Process

The U.S. Preventive Services Task Force (USPSTF) is an independent body of 16 nonfederal experts in prevention and evidence-based medicine that have expertise across the broad swath of primary care, including family medicine, internal medicine, nursing, obstetrics and gynecology, pediatrics and behavioral medicine. The Task Force's volunteer members, who include both practicing and academic clinicians, serve 4-year terms and are appointed by the director of the Agency for Health Research Quality. This agency provides administrative, scientific and technical dissemination support for the Task Force.

The USPSTF makes recommendations on clinical preventive services to primary care clinicians. The USPSTF's scope for clinical preventive services includes screening tests, counseling, and preventive medications. Recommended services are offered in or referred only from the primary care setting, and USPSTF recommendations apply to adults and children with no signs or symptoms of the conditions the recommendations aim to prevent.

Anyone can nominate a topic for the USPSTF to consider via its Web site (http://www.uspreventiveservicestaskforce.org, accessed October 24, 2014). The public may suggest a new preventive service topic, or recommend the Task Force reconsider an existing topic owing to new evidence or changes in the public health burden of the condition a prevention intervention targets. Topic nominations are accepted year-round, and are considered by the USPSTF at its three annual meetings. The public is invited to comment on the USPSTF research plan for the service it is reviewing, as well as on its evidence report and recommendation statement, before each are finalized (http://www.uspreventiveservicestaskforce.org/Page/Name/methods-and-processes, accessed October 24, 2014).

The USPSTF makes its recommendations after consulting with experts and conducting a rigorous review of peer-reviewed published studies on the intervention. This review assesses the benefits and harms of all the outcomes of applying the intervention for specific populations, which are broken down by age and sex. Before making its recommendations, the Task Force assigns a certainty value to its assessment of the net benefit of a preventive service, based on the number, quality, or consistency of studies and their applicability to practice.

All of this information is used to grade its recommendations, with A and B grades given to interventions in which the net benefit is substantial or moderately substantial and for which there is good certainty. C recommendations are given when the benefits and the harms are balanced and there is moderate certainty that the overall net benefit is small. Such recommendations require discussing the intervention with patients and soliciting their input as to whether they wish to pursue it, Kemper noted, unlike A or B recommendations, which should be routinely provided. The Task Force gives D recommendations if they recommend against the service because the potential harms outweigh the potential benefits.

BOX 3-1 Continued

When the current evidence is insufficient to make a judgment on an intervention's benefits or risks, the Task Forces provides what is known as an I statement. "I statements are really important because we need to know where the gaps are in our scientific judgment. The NIH looks at these I statements when it prioritizes what sorts of research needs to be done," Kemper said. He ended his presentation by stressing that the Task Force does not consider the economics of the recommendations it makes and their cost-effectiveness, but rather whether a particular recommendation is likely to lead to benefit for the population of interest.

Grade	Definition
A	The USPSTF recommends the service. There is high certainty that the net benefit is substantial.
B	The USPSTF recommends the service. There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial.
C	The USPSTF recommends selectively offering or providing this service to individual patients based on professional judgment and patient preferences. There is at least moderate certainty that the net benefit is small.
D	The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits.
I Statement	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality, or conflicting, and the balance of benefits and harms cannot be determined.

High Certainty: Evidence includes consistent results from well-designed, well-conducted studies in representative primary care populations, using health outcomes. Conclusion unlikely to be strongly affected by the results of future studies.

Moderate Certainty: Evidence is insufficient to determine the effects on health outcomes, but confidence in the estimate is constrained by limitations in the research. As more information becomes available, magnitude or direction of the observed effect could change, and change may be large enough to alter the conclusion.

Low Certainty: Available evidence is insufficient to assess effects on health outcomes.

SOURCE: USPSTF, 2014.

Kemper noted that the USPSTF has made few recommendations related to child development and behavior. Examples of those that have been made include B recommendations for screening for a major depressive disorder in adolescents when systems are in place for follow-up, and for interventions to prevent the initiation of smoking and tobacco use in this population. The Task Force concluded that thus far there is insufficient evidence (see table in Box 3-1) to make recommendations regarding suicide risk, alcohol misuse, or illicit or nonmedical drug use in adolescents, nor is there sufficient evidence to make recommendations for screening for major depressive disorders in children aged 7 to 11 years.

The USPSTF is currently reviewing studies on autism spectrum disorder and is updating the insufficient evidence assessment it previously made related to speech and language delay for children 5 years old and younger.

In response to a question by a participant, Kemper noted that it is possible for the USPSTF to evaluate the evidence and make a recommendation on the value of various types of counseling designed for primary prevention. The Task Force would evaluate what are the harms and benefits of providing the counseling and whether the counseling leads to the intended outcome.

Mary Jane Rotheram-Borus of the University of California, Los Angeles, asked if the USPSTF would consider evaluating parenting practices. “How can we get something like parenting classes linked to outcomes?” she asked, noting the abundance of data that links poor parenting practices to a number of high-cost negative outcomes, such as a lack of adherence to asthma prevention measures. Kemper responded that parenting classes can affect a number of different outcomes, but the USPSTF only evaluates primary prevention interventions applied to the population at large for a targeted condition in controlled trials (see Box 3-1). “It just doesn’t fit in there exactly right—you have to think about whether it fits into the primary prevention paradigm or is it really secondary or tertiary prevention,” he said. He added that the latter would be more appropriately evaluated by another organization that provides guidelines for pediatric care, such as the American Academy of Pediatrics, including Bright Futures, which is a national health promotion and disease prevention initiative that addresses children's health needs in the context of family and community, and the Centers for Disease Control and Prevention’s (CDC’s) community guide, which offers recommendations for community-level interventions for children.

Jeff Sugar, University of Southern California, asked if the USPSTF has evaluated interventions for maltreatment. Kemper responded that this is a topic that the Task Force would evaluate and make recommendations on, although they would have to consider assessing whether all children ought to be screened for child maltreatment.

INTEGRATING SILOS

A theme question at the workshop was how to integrate silos, including mental, behavioral, public health, and primary care, as well as how to integrate the various government agencies that oversee the domains in which children are cared for, such as public schools, Medicaid, child welfare, and juvenile justice agencies. Better communication and sharing of data and objectives also could occur in the various child-focused professions such as child psychiatry and psychology, school social work, teaching, nursing, and counseling.

Kellam suggested various sectors and disciplines could integrate their services to achieve the common goal of having children reach their full potential. Other participants concurred and

added that there be incentives so that goal is met. “The boundaries we have created are suboptimal for dealing with the world as it is, and we need to think about the world as it could be,” Brown emphasized.

Public Health and Primary Care

Advocating for more merging of public health with primary care, Hawkins noted that it is difficult to get uptake of universal preventive interventions, such as those given to parents of adolescents, when these EBIs are offered in schools and other community settings. He suggested that if primary care physicians recommended such interventions to the parents of all their pediatric patients once they approach adolescence, there may be greater uptake of these interventions.

But as Frank responded, reimbursement and referral systems are driven by a medical, insurance-based model that is not a public health model. He noted that does not preclude funding public health organizations that can bridge the gap and reach out to pediatricians and family doctors so they are more likely to refer such services to their patients. He added that the health homes for Medicaid beneficiaries being funded by the ACA are currently experimenting with expanding into the public health arena by connecting adults and children with multiple chronic conditions to housing, nutritional support, and other types of social services. However, Sugar expressed caution over using the primary care setting to deliver, rather than refer out, social and emotional training and stressed that, “If you treat kids in a primary care setting you are going to get a very medicalized treatment for social problems, which hasn’t worked well.”

Members of the child welfare and juvenile/family justice breakout group noted that schools and primary care settings are ideally positioned to engage in primary prevention or universal prevention activities, including screening and assessment programs, and that once children enter the child welfare or juvenile justice systems, there is a greater need for more targeted and intensive types of prevention programs. Finding funding for such prevention efforts can be problematic, however. One participant noted that because preventive services are often offered in school or community settings, the savings they foster in primary care is not returned to preventive care programs, like it is in totally accountable care organizations. “Prevention is often in places that are outside of where this pay-for-performance may actually be effective,” he noted.

Director Harding noted that the Substance Abuse and Mental Health Services Administration (SAMHSA) now has an internal mission to bring behavioral health into primary care. She also pointed out that in terms of funding, some prevention programs fit nicely into primary care while others probably never will, even though “they could be a huge asset to the community. If we don’t address some of the issues of substance abuse and mental health disorders, we will not have the healthy society we are striving for.”

Kelleher emphasized in his presentation that many costs and problems in the health care system relate to undetected or untreated behavioral problems in families and children; moreover, “without integrated behavioral health and primary care, we are not going to make a lot of progress.” But such integration is not just a matter of integrating budgets. He also called for decreased use of behavioral health carveouts in managed care, national telemedicine standards to ease the electronic transmission of medical information from one system to another, and integration of foster care and juvenile justice health services and data so there can be cross tracking and monitoring of resources, expenses, and outcomes of children in these systems with the health care records.

Integration of Data Systems for Children

Many participants of the breakout groups stated support to the suggestion of harmonizing and exchanging electronic data and other information between the various domains in which a child is involved, including schools. Kellam noted that there are 14 different systems of information regarding children, and few actually relate to local communities over time. He suggested having an information system that combines health care and educational data on children would enable better integration of services provided at the community level. "There's about to be a whole new health system that's totally unrelated to the developmental information that's in the school information system, and the laws do not allow people in these two sectors to exchange information. Now that we're developing ACA, we need to take this opportunity to shape a single information system that tracks kids and their needs over time across academic, behavioral, and health issues. We may never have this opportunity again," Kellam emphasized.

Palinkas noted that there are existing models for how technology can aid the flow of information about children across sectors, such as CDC's linked network of service. However, he also mentioned that the legal system has not caught up with the technology such that it is difficult to forge data-sharing agreements between different organizations. There may need to be state-by-state negotiation of data-sharing agreements or some other legal strategy to enable more data exchange across sectors. "This is something that we need to begin working on," Palinkas said.

Participants in the child welfare and juvenile/family justice breakout group also suggested there be greater face-to-face communications of the appropriate personnel in these sectors, such as between a child welfare worker and probation officer or school psychologist. This communication could be a job requirement, such that child welfare workers are expected to interact with representatives from other systems. But that would require reimbursement structures that support these interactions, "Because many times a child welfare worker does not get paid for calling up a probation officer and trying to coordinate services," Palinkas said. Integration of information across sectors can also be impeded by a lack of a common framework or language, Kellam noted. "Do we use the psychologist's language or the educator's?" he asked. He suggested developing a common language for professionals that care for children.

A participant in the schools breakout group added that it would be helpful if, instead of juvenile justice agencies being solely responsible for the education of their incarcerated clients, schools share that responsibility "because the schools are going to do a better job of it."

Integration of Disciplines

In addition to integrating sectors, members in the schools breakout group suggested there be more integration of disciplines. Participants in the group suggested training teachers and school nurses in behavior management and in child mental health and prevention programs. Child psychiatrists and school psychologists should also receive training in such areas, as well as experience in the classroom setting, Kellam said. He noted that although one of the largest health care expenditures is stimulant medication for children prescribed by psychiatrists, as a way to improve school performance, child psychiatric residents often are not required to operate within schools and experience the classroom setting. He added that teachers often receive little education in child development in college or as training in classroom behavior management. The

national accreditation of the schools of education does not require such training of the teachers they certify, he said.

School nurses could also being doing more than attending to sick or injured children in the schools, Kellam added. Such personnel could be screening children and families for mental and physical health issues, or providing prevention programs, if they were trained to do so. One participant in the schools breakout group pointed out there is an ongoing initiative to use nurses to provide education and interventions aimed at reducing substance use in schools, and the early data from this program looks promising. Teacher in-services that show how social and emotional interventions affect the developmental course of children and their educational achievement might also be useful, another participant noted.

Integration of Research with Practice

Participants in the child welfare and juvenile/family justice breakout groups suggested there be more partnership development that would link academic researchers or government officials to those in the field. Palinkas noted that programs such as the Patient-Centered Outcomes Research Institute (PCORI) and the National Institute of Mental Health (NIMH) in general have requirements for how research–practice partnerships should be developed. A major challenge in any partnership with the community is the issue of trust and long-term commitment required to build that trust. This commitment can be contrary to academic pressures to "publish or perish," which make it difficult to take the time to build that trust, Palinkas pointed out. But qualitative methods, in which participants are interviewed about what their needs are and which programs would be useful to them, offer a way of building trust in the community and engaging it more so than "simply handing out surveys and questionnaires or running randomized controlled trials," Palinkas said.

Members of the schools breakout group also concurred with the need for joint research projects on substance abuse or some other topic with practical outcomes and applications in the school community. This research would require public health or academic researchers to partner with school personnel or other people "who have their boots on the ground from all disciplines to melt that basic science and community intervention together," one of the breakout participants emphasized. Participants in the schools group also suggested forging partnerships between schools and the communities they are in so different agencies and programs work together at the local level around common child-centered goals.

Integration of Agencies

Social welfare and juvenile/family justice breakout group members pointed out that in order to have federal and local partnerships for youth prevention programs, there needs to be an alignment of Medicaid demonstration authority with the waiver programs, such as Title IV-E that are available for child welfare and juvenile justice. Currently, there is misalignment such that youth in the juvenile justice system are ineligible for Medicaid under certain conditions, such as when they are incarcerated for extended durations in federal prisons or jails. Participants in this breakout group also suggested performance pilots could be a way to bring different funding streams together for research-practice partnerships for disconnected youth.

Chambers noted that a current barrier to funding prevention programs is the lack of integration and coordination between funding sources. A grant program offered by the

Department of Education for schools is not tied to one for primary care or child welfare settings, for example. "This perpetuates the disconnection and duplication of effort, and you end up with much more expensive and less effective programs," Chambers said.

Harding noted that SAMHSA, which funds states and communities, has four separate divisions with their own appropriations: substance abuse prevention, substance abuse treatment, mental health, and data and quality. She noted it is difficult to integrate programs within the agency, let alone in the outside world. But SAMHSA recently initiated a Center for Prevention Implementation Methodology (CePIM), which is applying both the mental health and substance abuse divisions in SAMHSA to four programs focusing on underage drinking, suicide, school programming, and community. For its 2015 budget, SAMHSA has also proposed using funds allocated for substance abuse prevention and offering it to mental health communities so they can add a substance abuse component in order that "Community providers as well as our SAMHSA-funded communities can work together and learn from each other on the ground," Harding said.

SAMHSA also participates in the U.S. Department of Health and Human Services (HHS) Behavioral Health Coordinating Committee that coordinates all 11 agencies within HHS. This committee focuses on early intervention, prescription drug abuse, teen drinking, integrating behavioral health care with primary care, and behavioral health communications. The committee meets monthly and each of the agencies has representatives on subcommittees. "We are working much closer together and getting results at the federal level," she said.

One workshop participant pointed out a program under development at the Community Preventative Services Task Force of the CDC, which plans to offer a decision implementation support system. This learning system will assist decision makers to identify and select programs and evidence-based strategies so they can meet specific goals while matching their needs and financial or other constraints. Their goal is to provide a dynamic system so there is a dialogue about how these programs can be implemented across sectors, and sharing lessons learned that will hopefully promote collaboration among decision makers across several sectors, the participant reported.

Rotheram-Borus noted the tension that can occur between needing funding specifically targeted for prevention and wanting cross-sector integration. She pointed out that the Department of Education authorizes prevention under several titles, but overall states and school districts are not using those funds because of current budgetary constraints. She suggested that unless there is targeted and categorical funding for prevention, it is not likely to occur.

Perhaps there should be a separate agency for youth prevention or youth development at the federal level, rather than have youth prevention spread out among so many different agencies, as it is currently, suggested Brown, as well as members of the child welfare and juvenile/family justice breakout group. Such an organization would avoid duplication of efforts in the primary care, school, or child welfare settings, Palinkas noted. Chambers added that several members in the health care breakout group discussed having greater coordination around prevention programs for children, and suggested it be done at the state level. Members of the group suggested that state agencies "share the headaches" and work together to solve shared problems. "It seemed like where this had worked was at the top levels of the state system, including the governor's office, where there was ability to see ways to incentivize the individual sectors," he said.

Chambers noted that coordination at that level is especially important in regards to funding programs. "You often have this parsing out of different funds that are actually going to

support the same population. So although the infrastructure to deliver programs would be at the local community organization level, the resources to support them need to be coordinated at a higher level," Chambers said. Bruns added "States are where resource decisions are made." However, Jennifer Tyson, Office of Juvenile Justice and Delinquency Prevention, highlighted the importance of community engagement—that though a higher level should coordinate prevention programs, one should not forget the importance of communities knowing best their own structure and what programs are likely to work for them, as well as which local organizations are best suited to carrying them out. "The community should define how that sharing should happen because without that you will be underestimating how much they know about themselves, and how things operate on the ground," she said.

PROVIDING MORE FINANCIAL SUPPORT FOR PREVENTIVE INTERVENTIONS AND THEIR IMPLEMENTATION

Several workshop participants noted a major barrier in scaling up EBIs is a lack of funding for prevention programs, as well as a lack of funding for their proper implementation. Bruns pointed out that specific budget requests and financial incentives for child-centered EBIs are declining and have not increased since the last decade. Budgets for mental health, in general are on the decline, he added. Kimberly Hoagwood of the New York University School of Medicine pointed out that data by Kessler and colleagues (2005) show that 75 percent of mental health issues begin under age 24. However, in most states much more funding is used to pay for adult mental health systems than those for children.

In addition, more budgets tend to be allocated for treatment rather than prevention. Bruns noted that behavioral health services have an overall penetration rate of about 10 percent, accounting for about 38 percent of total Medicaid child expenditures (Pires, 2014). However, that money is spent disproportionately on residential treatment and therapeutic group homes. This intensive residential care accounts for the largest percentage of total expenditures (19 percent) for only about 4 percent of children receiving behavioral health services. In Washington State, in 2005 half of the children who received services from two or more agencies in the Department of Social and Health Services, used up half the budgeted mental health resources (DSHS, 2004). Bruns pointed out in a graphic that an inordinate amount of resources go to these children with complex needs requiring in-patient or institutionalized care, and the challenge is to use more of those resources for prevention, early intervention, behavioral health, and primary care (see Figure 3-2). "We need to divert those dollars to upstream efforts," he emphasized.

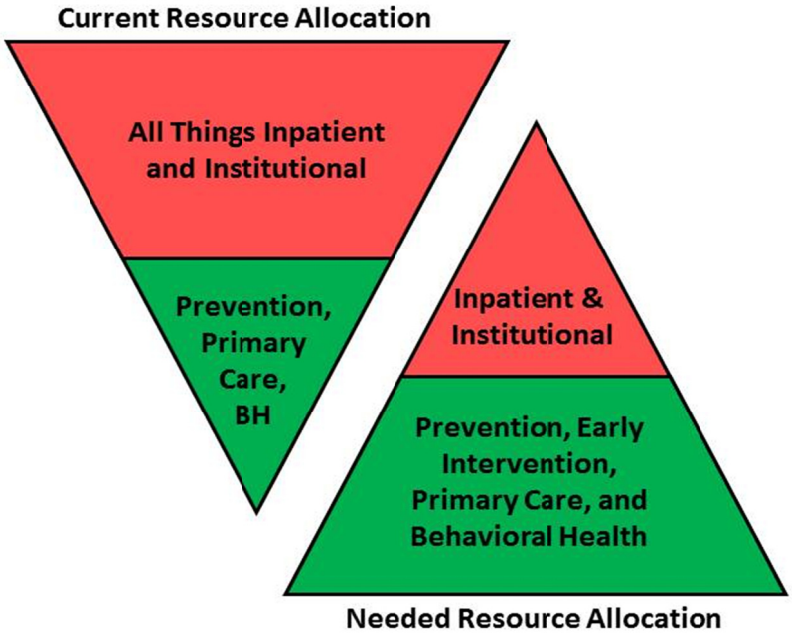

FIGURE 3-2 Flipping the triangle.
SOURCE: Dale Jarvis and Associates, 2014.

During discussion, Brent suggested there be some economic modeling of resource allocation that could indicate how much funding should be used for prevention programs versus treatment programs. This modeling could consider the cost savings of prevention programs and other factors that might more logically indicate how funding should be divided between the two types of programs.

As discussed in the workshop previously sponsored by the Forum (IOM and NRC, 2014), several participants suggested there be greater funding and infrastructure support for building capacity so prevention programs can be implemented more effectively. For example, Samuels pointed out that most states do not require clinical training of their social workers or caseworkers, so most child welfare leaders work their way up through the system and do not necessarily have clinical training. There is the need to educate these people involved in carrying out prevention efforts about the consequences of child maltreatment, he said. Participants in the health care breakout group suggested there be state infrastructure support for implementation of EBIs. Members of the child welfare and juvenile/family justice breakout group suggested there be more focus on technical assistance and capacity building, including providing support for training and staffing of programs.

Bruns added that often EBI initiatives work better in academic research settings than in the real world because usual care in academic settings tends to involve lower case loads, high-quality supervision, and specialized training, compared to usually understaffed and insufficiently funded organizations that implement prevention programs. Instead of viewing these differences as confounding factors, he suggested trying to emulate them and provide the support needed for

them in community settings. “It’s not that we’ve got a problem with the research, but these are the things we should be doing in usual care,” he said. For example, Washington State’s juvenile justice department developed an integrated treatment model that applied specific relevant types of evidence developed in an academic setting to residential care and parole. Research revealed that once parole staff was trained in functional family therapy, and 1 year after they began providing it, youths who did not receive such therapy were 48 percent more likely to get arrested and 55 percent less likely to be employed than those that received it (DSHS, 2011).

REFERENCES

Dale Jarvis and Associates, LLC. 2014. *About Dale Jarvis and Associates* http://www.djconsult.net/about (accessed September 4, 2014).

DSHS (Washington State Department of Social and Health Services). 2011. *Effects of functional family parole on re-arrest and employment for youth in Washington State*. http://www.dshs.wa.gov/pdf/ms/rda/research/2/24.pdf (accessed September 2, 2014).

IOM and NRC (Institute of Medicine and National Research Council). 2014. *Strategies for scaling effective family-focused preventive interventions to promote children’s cognitive, affective, and behavioral health: Workshop summary.* Washington, DC: The National Academies Press.

Kessler, R. C., P. Berglund, O. Demler, R. Jin, K. R. Merikangas, and E. E. Walters. 2005. Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey replication. *Archives of General Psychiatry* 62(6):593-602.

NIH Toolbox. 2014. *NIH Toolbox For the Assessment of Neurological and Behavioral Function*. http://www.nihtoolbox.org/Pages/default.aspx (accessed August 8, 2014).

Pires, S.A. 2014. Children in Medicaid with behavioral health challenges. *CMS Grand Rounds*, May 8, 2014.

USPSTF (U.S. Preventive Services Task Force). 2014. *Grade definitions* http://www.uspreventiveservicestaskforce.org/uspstf/grades.htm (accessed September 4, 2014).

Zatzick, D. F., T. Koepsell, and F. P. Rivara. 2009. Using target population specification, effect size, and reach to estimate and compare the population impact of two PTSD preventive interventions. *Psychiatry* 72(4):346-359.

4

Innovative Strategies and Opportunities

Several presentations and discussions on innovative strategies focused on system-level levers and blockages in funding implementation of evidence-based preventive interventions for children and on new business models. These strategies include forging public–private partnerships, and applying new or underused funding provided by various divisions of the Department of Health and Human Services (HHS), as well as ways to build consumer demand for evidence-based interventions (EBIs).

ADDRESSING BARRIERS WITH NEW BUSINESS MODELS AND FUNDING MECHANISMS

Kelly Kelleher of The Ohio State University and Nationwide Children's Hospital in Columbus, Ohio, began his presentation by noting that a major barrier to broad-based implementation of EBIs is a lack of sustainable funding for them, particularly those that rely on government funding because when the grant funding runs out, or the government changes, the funding disappears, he said. "I've spent many years trying to implement prevention programs, and I have become convinced that, in our current medical system, the only thing that really matters is does it (the intervention) get paid for, because our system figures out what to do about all the other issues," Kelleher said.

He pointed out that prevention initiatives are often not reimbursed because they usually do not occur in medical settings, frequently use unlicensed professionals, or offer group interventions, for which it is difficult to bill an insurer. Grants often do not cover the expense of professional development and infrastructure, he added, and regulatory or legislative mandates are often too specific for prevention initiatives, require piecing together several funding sources that have to be continually renewed and that change as governments change.

Public–Private Partnerships

An innovative way to support a prevention initiative is to create a sustainable business model that is based on a shared value between a business and a social agency, such that their partnership can carry out a social good while simultaneously offering a sustainable business opportunity, Kelleher said. These partnerships require clear outcomes that can be measured, intensive data collection, and alignment of incentives for both the business partner and the social good, Kelleher noted.

Partners for Kids

Kelleher reported on a public–private partnership he is involved with in Columbus, Ohio, called Partners for Kids (PFK). This partnership between Nationwide Children's Hospital and 800 physicians was formed 10 years ago as an intermediary insurance organization and is now an accountable care organization. The Ohio Department of Medicaid contracts with five Medicaid

managed-care organizations, which take off an administrative fee and pass all the remaining resources to PFK. PFK then uses these capitated payments for the 300,000 children in the program to pay for their medical costs across the health spectrum.

It took a concerted effort involving many meetings with the governor of Ohio, the Centers for Medicare & Medicaid Services, and diverse hospitals and provider groups that supported the program to forge this public–private partnership and have one accountable payer for all children's services in 34 rural and urban counties in central and southeastern Ohio, Kelleher noted (see Figure 4-1). What aided its implementation was the recognition that "kids were different and that pediatric exclusivity was really of value to the state Medicaid director, who was a pediatrician," Kelleher said.

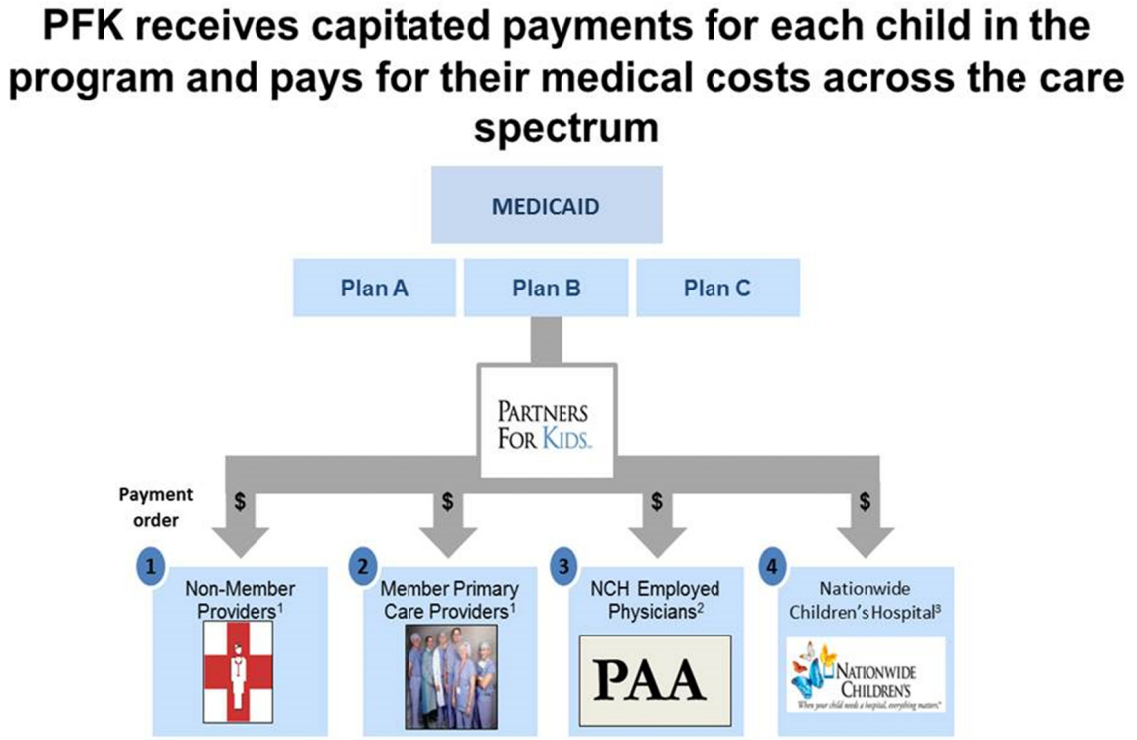

FIGURE 4-1 Funds flow in Partners for Kids contracting.
SOURCE: Kelleher, 2014

A major expense for PFK was the cost of behavioral health drugs, which made up one-third of all the pharmacy costs for the children PFK covered, many of whom came from inner-city, low-income areas and were being treated in emergency rooms. To reduce the costs of treating such children for behavioral problems, PFK focused on preventing them with such EBIs as the Good Behavior Game, The Incredible Years®, Safer Choices, and home visiting with the Supporting Partnerships to Assure Ready Kids (SPARK).

"The physician–hospital organization has committed to introducing these programs because the long-term growth and health of the community are critically important," Kelleher

said. Children's hospitals in close to 10 states have also developed partnerships similar to PFK, and about half of these provide prevention initiatives targeting the neighborhoods that could most benefit from having them. "It's not unique to Columbus, but it's actually the beginning of something that hospitals are understanding—it's not only an ethical mandate, but a business mandate," Kelleher said.

PFK is also part of a pay-for-outcomes business plan for an alliance of rural agencies in southeastern Ohio that serve Appalachian children. PFK and Nationwide Children's Hospital pay social service agencies that are part of the alliance a flat fee every time they enroll a child in Medicaid. But the social service agencies receive additional fees for providing beneficial yet cost-saving services and outcomes in their members, such as providing their clients with a long-acting, reversible contraceptive or early prenatal care that results in the birth of a healthy baby. The agencies also receive an additional fee if one of their teenagers participates in the Safer Choices program and graduates from high school.

For its operations, PFK collected abundant data on its clients on a regular basis, including claims data that indicated costs, patient locations, and eligibility. In addition, the organization uses electronic health records to find children at risk who are starting to show patterns of concern, including those being admitted to the emergency room frequently for minor trauma. In addition, although PFK provides no obstetric care, it built a database registry for all prenatal providers in its system to enter their progesterone doses for women with prior preterm births and immunizations and long-acting contraceptive data into a system that could serve as a common community platform that PFK analyzed for quality of care. For a selected subset of clients, such as children with gastric feeding tubes, PFK administered surveys to their families to assess activities of daily living scales and satisfaction in an effort to monitor and change practice.

Social Accountable Care Organizations and Social Impact Bonds

Social accountable care organizations, also called total accountable care organizations, are an extension of the accountable care organization concept that address social and human service concerns in addition to physical health concerns. Public health advocates have argued that many determinants of health are social and that to address them adequately requires social and human service interventions, Kelleher noted. These organizations not only provide medical care for their clients, but they are also partnering with state agencies to provide school-based mental health, juvenile justice, and foster care services in their early forms.

Richard Frank, assistant secretary for planning and evaluation at HHS, reported on social impact bonds, also known as pay-for-success bonds. These bonds are a new idea that originated in the criminal justice arena in the United Kingdom. For the last three budget cycles, President Obama has proposed about $100 million per year in social impact bonds, although only a starter fund of $10 to $20 million per year was actually budgeted for these initiatives that have come out of the Departments of Justice and Labor and are just starting to emerge in HHS.

Social impact bonds are issued by the federal, state, or local government, and offer participating investors payouts based on the achievement of program outcomes, which are monitored by the private sector. The private up-front money relieves public budgets and shifts the risk of investment in programs from the government to the private sector. If the program that is supported is successful, the private investors receive from the government their original investment plus a rate of return above that based on the achievement of particular outcomes that are socially desirable. In addition to the outcomes they aim to achieve, typically social impact bonds result in savings of public monies, Frank pointed out, and are currently being used to

support nurse home visitation, targeted prekindergarten, and child abuse and neglect prevention programs.

Social impact bonds usually involve four parties—investors, an intermediary, government, and nonprofits. The investors fund interventions and earn financial returns on them. Frank noted that investors also serve as evaluators of a program's feasibility as part of the vetting of the investment they make, which adds another level of accountability. The government pays only for programs that work and shares its cost savings with investors. Usually an intermediary organization, which originates the deal, secures government commitment and structures and manages the partnership. This organization provides financial intermediation and operating oversight over the life of a social impact bond, and manages the evaluation of outcomes conducted by a third party. Nonprofits provide the actual services after receiving working capital up front (see Figure 4-2).

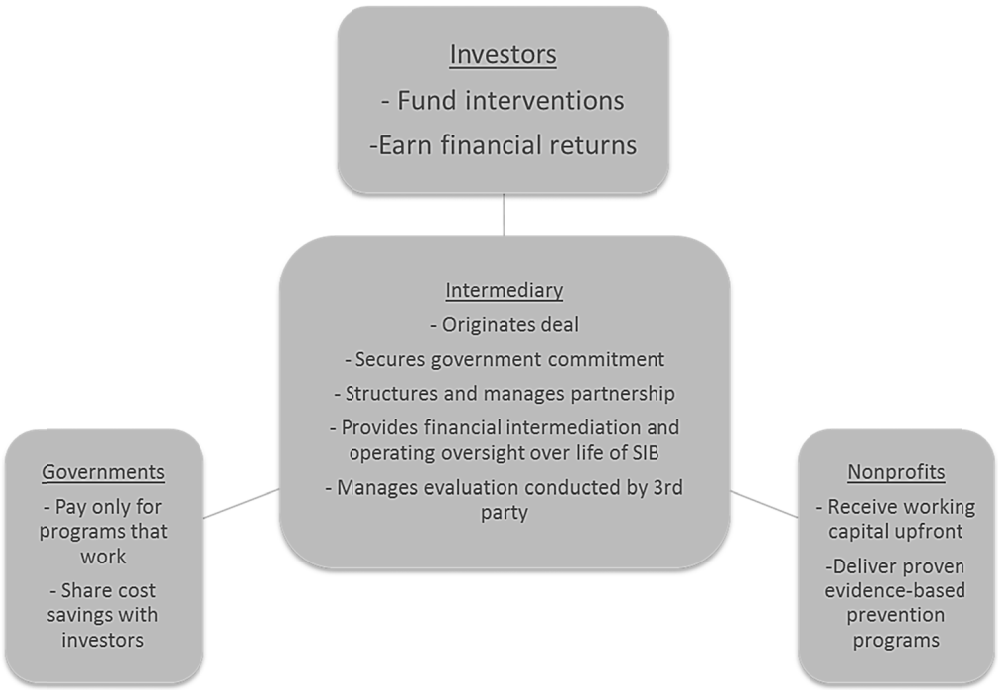

FIGURE 4-2 Social impact bonds.
NOTE: Social impact bonds refers to a new and innovative financing vehicle for social programs in which government agencies define desired outcomes and provide payment to external organizations that achieve those outcomes.
SOURCE: Frank, 2014.

Social impact bonds create new sources of funding for prevention initiatives and are popular among politicians because the government only pays for programs shown to work, Frank noted. Social impact bonds are also attractive to investors because there are tax rules that provide incentives for these types of investments.

Frank added that one downside of this business model is that many valuable public programs do not generate savings quickly. For example, in nurse home visitation programs, in which nurses make home visits to pregnant women on Medicaid and for the first 2 years following birth of their children, many benefits, such as reduced rates of juvenile delinquency

and drug use in mothers' children once they become teenagers, are not accrued until several years after women start participating in the program, Frank pointed out. However, indicators of strong progress can be used for these programs with long-term payoffs, Frank said, with payments to investors tied to reaching certain of those milestones. He added that juvenile justice payoffs tend to occur quickly, and New York City has social impact bonds funding one of their programs in this sector.

Later during discussion, David Brent of the University of Pittsburgh added that behavioral health interventions can have an impact on physical health so their payoff can be determined by proximal measures that are more accepted and already in use, such as maternal depression, pediatric asthma, and emergency room visits. He also pointed out that social impact bonds can be bundled such that there is a mixture of short-term and long-term payoffs that makes it more attractive to investors. Frank concurred that bundling of social impact bonds was a good idea. He noted, however, that when one carefully analyzes health care outcome effects of preventive mental health services, they only work for a small slice of the population. This, Frank said, requires targeting programs to that group with the aim of making clinical advances, but not necessarily public health advances.

Frank added that social impact bonds also can be risky investments that make them unappealing to some investors, although there is potential to make them more attractive if foundations are willing to take on some of the risk. The ultimate effectiveness of social impact bonds as a means to support prevention programs is not known yet, Frank noted, because they are in the early stages of development.

In their breakout session summary, members of the child welfare and juvenile/family justice group expressed interest in public–private partnerships, such as those done between the Centers for Disease Control and Prevention (CDC) and community groups and those created by partnering with private investors. Members of the group discussed the necessity of developing a venture capital model that will appeal to community-based private investors.

Health and Human Services (HHS) Funding

Some presenters and workshop participants reported on new or underused HHS funding sources for prevention EBIs, including medical waivers and new opportunities offered under the Patient Protection and Affordable Care Act (ACA) and mental health parity legislation. Bryan Samuels of Chapin Hall at the University of Chicago noted that Title IV-E of the Social Security Act enables the Child Welfare Waiver Demonstration authority to provide states with an opportunity to use federal funds more flexibly in order to test innovative approaches to child welfare service delivery and financing. Using this option, states can design and demonstrate a wide range of approaches to reforming child welfare and improving outcomes in the areas of safety, permanency, and well-being (HHS, 2014).

Samuels pointed out that Title IV-E is the largest funding source that goes to state child welfare agencies to support out-of-home care for children. This federal waiver allows states the flexibility to use federal funding both for children who are in care but also for children before and after they came into such care to ensure adequate continuity of care. Samuels reported that about 20 states are currently applying those waivers to learn how to implement EBIs at the state welfare agency-level as well as to assess their effectiveness at the child and family level. HHS has the authority to grant waivers to 10 more states, he added.

Another source of funding for prevention EBIs are Medicaid waivers. Eric Bruns of the University of Washington School of Medicine noted that as a means for decreasing Medicaid expenditures for costly residential and psychiatric in-patient care, some states are applying more of their Medicaid funds to invest upstream in prevention and early intervention programs. "We need to find ways to encourage states to maximize the options available to them in Medicaid," Bruns said, and suggested Medicaid funds be used to cover a broader array of behavioral health home- and community-based services, and intensive care coordination using multimodal EBIs.

Hendricks Brown of Northwestern University suggested broadening the use of waivers beyond Medicaid and also considering using waivers from the Substance Abuse and Mental Health Services Agency (SAMHSA) as well as from across sectors, including using a combination of state funds allocated for education, juvenile justice, and child welfare programs. Director Frances Harding of the Substance Abuse and Mental Health Services Administration's (SAMHSA's) Center for Substance Abuse Prevention added that SAMHSA provides block grant funding for substance abuse and 20 percent of that fund is earmarked for primary prevention. SAMHSA has a discretionary portfolio, she said, under which communities or states could be funded to do screening for maltreatment as a way to help prevent mental and substance abuse disorders, if their data point to this need.

Lauren Supplee, Office of the Administration for Children and Families, reported that in the federal appropriations bill for fiscal year 2014, funding was allocated for Performance Partnership pilots, which are waivers for up to 10 communities to focus on improving outcomes in young people ages 14 to 24 who are homeless, in foster care, involved in the justice system, or who are not working or not enrolled in (or at risk of dropping out of) an educational institution (Department of Education, 2014). Performance Partnership pilots will allow a state, region, locality, or federally recognized tribe to propose pooling a portion of discretionary funds they receive under multiple federal streams while measuring and tracking specific cross-program outcomes. Supplee said that this model for pooling funds, combined with strengthened accountability for results, is designed to ease administrative burden and promote better education, employment, and other key outcomes for youth.

The Performance Pilots initiative, which is spearheaded by the Obama administration, does not provide additional funds, but rather enables more flexible use of existing funds (Department of Education, 2014). There will be waivers for education, labor, child welfare, SAMHSA, runaway and homeless youth, and other programs, according to Supplee. The Centers for Medicare & Medicaid Services (CMS) may not necessarily be a source for the waivers in this program, she added. But members in the health care breakout group suggested considering waivers and other payment flexibilities for the funds CMS provides that could be used to support prevention programs.

Frank reported that the Mental Health Parity and Addiction Equity Act (MHPAEA) of 2008 required group health plans and health insurance issuers to ensure that financial requirements (such as co-pays, deductibles) and treatment limitations (such as visit limits) applicable to mental health or substance use disorder benefits are no more restrictive than the predominant requirements or limitations applied to substantially all medical/surgical benefits (CMS, 2014). The law was limited to firms that offer mental health benefits as part of their coverage and to firms with 50 or more employees.

Frank also noted that the ACA, which was signed into law in 2010, further expanded coverage for behavioral health services by establishing mental health and substance abuse benefits as essential health benefits that must be offered at parity to other health benefits in

qualified health plans, just as they are for health insurance issuers and group health plans. It has been estimated that the ACA will newly insure about 30 million people (CBO, 2012), thus improving access to mental and behavioral health services and substance abuse treatment for many people.

The ACA also established a Prevention and Public Health Fund that could be tapped for prevention initiatives for children. In addition, the ACA supports innovative delivery systems for health care including accountable care organizations, Medicaid Health Homes, and patient-centered medical homes. These new health care systems are designed to shift the emphasis away from fee-for-service, insurance-based designs to more budgeted systems that still have an insurance component but are run by clinical organizations, Frank reported. This provides economic incentives to save money with prevention and early intervention programs, especially for clinical preventive services he noted, saying, "In theory, you would expect these new organizations to use that flexibility to invest in preventive services because they pay off, according to some evidence."

But the challenge will be providing the appropriate outcome measures that ensure quality clinical standards are being met, which is a stipulation for receiving funding from the ACA. The standards for behavioral health, Frank noted, are still in their infancy. In addition, measures of behavioral health have to be correlated to other clinical health measures, such as cardiovascular or pediatrics because of the growing emphasis on integrating behavioral health with physical health.

The ACA funding also cannot be used to support large-scale public health measures, which tie into social welfare, housing, and juvenile justice, Frank noted. "The incentives to do that are much weaker under these new organizations because you're asking people not only to use dollars that are based on health care accounting, but you're asking them to go way beyond their traditional areas of expertise and areas of touch," Frank said.

The ACA expanded federal community benefit requirements for nonprofit hospitals by creating new standards relating to the conduct of needs assessments whereby nonprofit hospitals, in consultation with the communities where they are located, identify the communities' health-related needs. Several participants in the schools breakout session suggested exploring whether the needs assessment could be used to support design and implementation of prevention programs in schools.

In one discussion session, a participant suggested manipulating CMS billing codes so providers may be reimbursed for early interventions for children who have experienced psychological trauma but who do not have a diagnosis of post-traumatic stress disorder. Such children tend to have other conditions for which CMS will reimburse care, he noted. "We can use less specific diagnoses sometimes for something more specific and get paid for it," he said. Samuels responded that the federal standard for treatment is medical necessity, which states tend to define as having a diagnosis. So in theory, based on the federal standard of medical necessity, one could get reimbursed for treating a child who has experienced trauma, but state law would not allow this. If one tries to bypass the need for a post-traumatic stress syndrome diagnosis by treating for another frequently related diagnosis, he added, then one is subjected to the specific treatment protocols for the other diagnosis such that the child is probably not getting care they need for their trauma, Samuels said.

Chambers reported that several members of the health care breakout group discussed the need to make a business case for prevention programs, and that effort should be made to tailor those programs so they fit existing funding streams. They also discussed how multiple funding

sources are often needed to cover the services as well as building the workforce needed to carry out those services.

BUILDING DISSEMINATION AND UTILIZATION OF EVIDENCE-BASED INTERVENTIONS

Several workshop attendees emphasized the need to build consumer demand for EBIs by assessing and responding to community needs, and by marketing the likely impact of the EBIs employed. A menu of EBIs should be offered from which communities can choose, Charles Collins of the National Center for HIV, STD and TB Prevention at CDC, as well as members of the health care breakout group suggested, and multiple EBIs may have to be used to meet a community's needs, Bruns noted. "We need to overcome some of our potentially outdated concepts about implementation of frameworks that are only geared to scaling up one EBI in the system, when we know we'll probably need multiple EBIs to cover all the needs of a population," he said.

Bruce Chorpita of the University of California, Los Angeles, noted that when he simulated enrolling approximately 2,000 youth matched for age, gender and presenting problem from the Hawaii state mental health system into randomized trials to determine the best fitting EBIs, the most relevant evidence-based program would serve only 34 percent of those youth. Adding an additional EBI would serve 49 percent, with additional benefits accrued by adding more interventions up to a maximum of 69 percent reached when eight different EBIs are used. Beyond eight, additional EBIs would not serve any additional youth in the system. Chorpita emphasized that "The bottom line is EBIs may not be sufficient to create high performance systems because about a third of the cases are exceptions, for which there are no matching EBIs available in the literature" (see Figure 4-3).

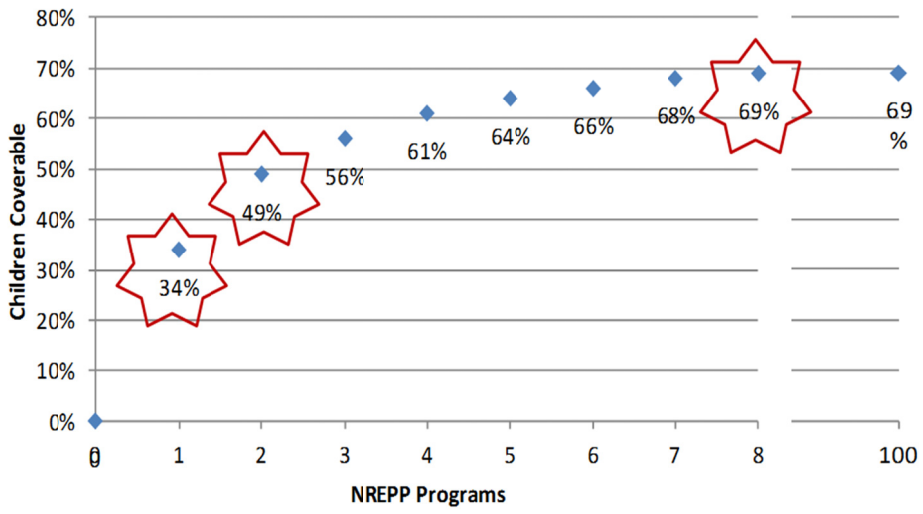

FIGURE 4-3 Matching youth to studies on problems, age, and gender.
NOTE: NREPP refers to the National Registry of Evidence-based Programs Practices.
SOURCE: Bernstein et al., 2010.

In addition, he found that although Los Angeles county mandates using EBIs with their prevention and early intervention programs, 39 percent of the cases he reviewed did not use an EBI. When EBIs were used, they did not match any of the youth's tops three concerns in 32 percent of those cases, so only about one-quarter of the youths in the system were getting an appropriate EBI. This study found that the biggest predictor of what providers deliver is whatever program they were trained to use, rather than characteristics of the youth. Furthermore, 94 percent of the time that providers delivered trauma-focused care, it did not match any of the child's top three concerns. So although there was great dissemination of EBIs in Los Angeles County, "They did not help the children with the problems for which they were seeking help," Chorpita said. He suggested not only matching EBIs better to the children that need them, but being dynamic about assessing and adjusting those that are applied with a strategy he developed called Managing and Adapting Practice (MAP), which is described in more detail in Chapter 2.

Collins noted the tension that often occurs between adaptation of EBIs when they are used in real-world settings and the fidelity required in order to have the same results seen in academic studies. "Adaptation tends to be a secondary thought for many researchers, but it's the exact reverse when you're dealing with communities," who have to adapt the intervention so it better meets the needs of clients and the staff running the programs, he said. He cautioned that such adaptation should be encouraged and not frowned upon, because "Adaptation is necessary for ownership, which is necessary for sustainability. Rather than adaptation being a frightening word, it needs to serve as a stimulus for your dialogue with your providers to begin to move towards fidelity," Collins said. If a community is only carrying out half of a program, instead of viewing them as being half non-compliant, he suggested, consider that "They're halfway there, and see how you can move them further."

Collins views implementation of interventions as a blending of behavioral science with local knowledge, and suggests that materials be flexible and rewritten based on the experiences learned from consumers. He suggested assessing why some interventions are not selected and implemented by consumers, and whether the staff leaves the training provided with the skills and materials to actually implement the intervention. He noted that communities frequently will indicate what interventions are not appropriate for them, and those programs should be dropped. Collins added that if different communities applying the intervention are achieving different outcomes, then assess if there are any implementation clues as to why one program is having better outcomes than another. "I think you have to think about the whole process step by step in terms of corrections to your system," Collins said.

Participants in the health care breakout group concurred that it is important to understand local community needs and how to meet them. Program delivery should be guided based on data collected from consumers. Members of the group noted it may be more appropriate to follow evidence-informed core principles than to have "manualized" delivery of EBIs. Collins noted that communities tend to need a packaged intervention that details how to recruit the target audience, as well as provides other concrete steps, including detailed lesson plans, whereas physicians or academic partners may just need principles, as opposed to packaged interventions. Some members of the health care breakout group also suggested engaging communities better so there is more community ownership of different interventions and marketing the impact of prevention to both consumers and funders using a range of mechanisms, including op-eds within local newspapers and reports in scientific journals.

Based on the experience CDC had in disseminating HIV prevention programs, Collins suggested using a range of dissemination partners and adjusting the intervention to the capacity of the disseminating organization. He noted that "Different partners have different tentacles reaching into different organizations," and CDC chose the appropriate range of partners as part of their dissemination strategy. He added that the CDC tries to include the original researcher of an EBI in the dissemination team, if that researcher is interested in being a dissemination partner with the CDC. However, not all researchers want to be involved in this way.

CDC also tries to balance community-developed interventions with academic ones. About 20 percent of the programs they disseminated and funded as part of the HIV prevention initiative were community developed, he reported. When CDC learned of a program that was developed in the community and saw that it had good process data, a logical model, and was starting to do pre- and postintervention tests on clients that revealed changes, it gave them an extra $100,000 for 2 years and then tested their outcomes, Collins said. This led to CDC discovering and more widely disseminating interventions developed by community practitioners. However, Collins cautioned that there must be good process measures, outcome monitoring, and consistent delivery of community-developed interventions before considering their adoption and dissemination.

Participants in the schools breakout group had a few suggestions for improving the uptake of EBIs in the school system, including emphasizing common shared goals and marketing prevention EBIs as able to meet the needs of not just students, but of teachers, and school administrators, while making their jobs easier rather than more burdensome. These participants also suggested using easily understood terms and familiar goals, such as the Common Core State Standards Initiative goals,[1] when conveying to schools that the social, emotional, and family supports that EBIs provide for children are needed for their students' academic achievement.

Having a system of common metrics for those goals that are publically reported for schools could serve as a lever to get EBI adoption in schools, one participant noted. Alternatively such metrics could be tied to school funding such that schools are rewarded financially when their students have better outcomes. Either way, the metrics will motivate teachers and school administrators to do proactive planning with those objectives in mind. For example, many schools receive more funding if they have greater student attendance, so an EBI that has been shown to boost school attendance could be marketed to schools as a way to increase their budgets, one participant noted.

Members from both the schools and the child welfare and juvenile/family justice breakout groups suggested establishing a clearinghouse for *what* EBIs have worked and *where*, including information on how to fund them, as well as EBIs that have failed when implemented in certain settings. Collins emphasized that "Negative findings are very important for being able to change direction and determine how you might work in a different way." Lastly, Bruns suggested that state centers of excellence be established for prevention EBIs.

[1]The Common Core State Standard Initiative sets academic standards in mathematics and English language arts/literacy and outlines what a student should know and be able to do at the end of each grade (Common Core, 2014).

REFERENCES

Bernstein, A. D., B. F. Chorpita, and E. L. Daleiden. 2010. *Mapping the relevance of evidence- based treatments to real service populations*. Symposium presented at the 44th annual convention of the Association for Behavioral and Cognitive Therapies, San Francisco, CA.

CBO (Congressional Budget Office). 2012. *Updated estimates for the insurance coverage provisions of the Affordable Care Act*. http://www.cbo.gov/sites/default/files/cbofiles/attachments/03-13-Coverage%20Estimates.pdf (accessed September 8, 2014).

CMS (Centers for Medicaid & Medicare Services). 2014. *The Mental Health Parity and Addiction Equity Act*. http://www.cms.gov/CCIIO/Programs-and-Initiatives/Other-Insurance-Protections/mhpaea_factsheet.html (accessed September 8, 2014).

Common Core. 2014. *About the standards*. http://www.corestandards.org/about-the-standards (accessed September 3, 2014).

Department of Education. 2014. *Performance Partnerships for Disconnected Youth*. http://www.ed.gov/blog/wp-content/uploads/2014/03/2014-PPPs-Fact-Sheet.pdf (accessed August 11, 2014).

Frank, R. G. 2014. *Economics, policy and scaling interventions for children's behavioral health*. Presented at IOM and NRC Workshop on Harvesting the Scientific Investment in Prevention Science to Promote Children's Cognitive, Affective, and Behavioral Health.

HHS (Department of Health and Human Services). 2014. *Child welfare waivers*. http://www.acf.hhs.gov/programs/cb/programs/child-welfare-waivers (accessed August 11, 2014).

Kelleher, K. J. 2014. *Prevention does not scale/sustain: Lack of payment*. Presented at IOM and NRC Workshop on Harvesting the Scientific Investment in Prevention Science to Promote Children's Cognitive, Affective, and Behavioral Health.

5

Wrap Up

During 2 days of presentations and discussions, participants explored numerous strategies and opportunities for disseminating and implementing evidence-based preventive interventions. Given that public funding for such efforts often is insufficient, several participants discussed other business models that may support these efforts, including social impact bonds and other public–private partnerships in which private investors provide the capital needed to support an intervention and then receive payouts from governments based on achieved outcomes. This requires monitoring outcomes and developing a venture capital model that will appeal to community-based private investors.

Several participants noted there also are new opportunities in the public sector that could be tapped, including provided by the Patient Protection and Affordable Care Act, which supports prevention interventions that are part of new health care delivery systems, such as medical homes and accountable care organizations. In addition, waivers from state and federal agencies provide flexible funding that could be used to support innovative prevention interventions for children.

Workshop participants also explored ways to build consumer demand for evidence-based interventions (EBIs), including offering a menu of interventions, combining several EBIs, and tailoring EBI selection so it best suits the needs of community organizations. Several participants noted that greater effort could also be made to market EBIs using a common framework, adopting terms used by the targeted consumers of the interventions, and using a range of dissemination partners. During the discussion some participants also suggested that community engagement in EBIs could be fostered by balancing community-developed interventions with academic ones, and by evaluating and adapting EBIs while they are implemented so they better suit consumer needs.

Suggested ways to overcome the barriers that still exist for prevention EBI dissemination and implementation included developing appropriate metrics, standards, and guidelines that can aid the public funding and private investment in these programs, as well as ensuring consumer needs are being met. Integration of silos was also considered key, including integrating public health into primary care, and integrating data systems for the various domains in which a child is involved, such as schools, health care systems, and child welfare or juvenile justice agencies. Several participants noted that there could be better integration and coordination of agencies overseeing the welfare of children, as well as better integration of their funding sources and discussed having a new federal agency devoted to prevention in youth or youth development. Better integration of child-focused disciplines—for example, by setting a common goal for various sectors and disciplines—was also a topic of discussion, as well as integration of academic and government research with practice in the field, including the need for more research partnerships between communities and government personnel or academic researchers.

The workshop also explored new technologies and analytic methods for dissemination, implementation, and quality improvement of prevention EBIs, including Web-based systems that can be used to tailor EBIs more effectively to the organizations adopting them, or to deliver

interventions. Some workshop participants spoke about how new statistical methods combined with greater dissemination of technology can enable researchers as well as consumers to assess the effectiveness of multiple interventions while they are being implemented, and to adapt them appropriately. Some participants also noted that sensors and mobile phones enable the collection of personal data that can make interventions easier to use and more effective.

In summary, while current public funding for preventive EBI dissemination and implementation may be wanting, methodological and technological advances in EBI development, coupled with innovative business models and new public sector opportunities may be leveraged to both meet consumer demand and increase preventive EBI utilization.

Appendix A

Workshop Statement of Task

Harvesting the Scientific Investment in Prevention Science to Promote Children's Cognitive, Affective, and Behavioral Health: A Workshop

Statement of Task: An ad hoc committee will plan and conduct an interactive public workshop featuring presentations and discussion of novel design strategies for increasing implementation of evidence-based approaches to support children's cognitive, affective, and behavioral health. The workshop will focus on:

- examining principles, practices, and processes that are robust and common across evidence-based interventions (EBIs)
- highlighting key opportunities and barriers to the broad diffusion of EBIs within and across sectors, including schools, primary care, juvenile justice, and child welfare; perspectives will include those of end users of EBIs
- examining the roles of scientific norms, intervention implementation strategies, and practices in care quality and outcomes at the national, state, and local levels
- discussing changes that could be made in financing models, scientific models, and implementation models in order to broadly implement EBIs
- exploring data farming (technological) and analytic strategies that allow iterative quality improvement that could facilitate data-driven adaptation of EBIs
- learning from federal, state, and local administrators about the approaches they have adopted to increase the quality of science-informed prevention in their jurisdictions
- discussing the interfaces and boundary challenges between existing diffusion strategies for EBIs and potential alternative models
- exploring approaches across diverse populations of children and families[1]

The committee will identify specific topics to be addressed, develop the agenda, select and invite speakers and other participants, and moderate the discussions. An individually-authored summary of the presentations and discussions at the workshop will be prepared by a designated rapporteur in accordance with institutional guidelines.

[1]The workshop examined approaches across a variety of settings and sectors in which children and families receive health care and supportive services. Additional cultural considerations were discussed in the forum's previous workshop *Strategies for Scaling Effective Family-Focused Preventive Interventions to Promote Children's Cognitive, Affective, and Behavioral Health* (IOM and NRC, 2014).

Appendix B

Workshop Agenda

Harvesting the Scientific Investment in Prevention Science to Promote Children's Cognitive, Affective, and Behavioral Health: A Workshop

Hosted by the IOM-NRC Forum on Promoting Children's
Cognitive, Affective, and Behavioral Health

June 16-17, 2014

Lecture Room and NAS 120
National Academy of Sciences Building
2101 Constitution Ave, NW, Washington, DC

AGENDA

There have been major successes in creating evidence-based interventions (EBIs) over the past 50 years—examples of which were presented at the Forum's first workshop, held April 1-2, 2014, on strategies for scaling effective family-focused preventive interventions. This second Forum workshop will focus on the opportunities and outcomes currently taking shape within a vortex of multiple converging forces, including, but not limited to, new federal mandates to broadly implement EBIs, especially in health (including mental health) care with the Affordable Care Act and the Mental Health Parity Act; decreasing social and behavioral prevention funding nationally; the needs of implementers of EBIs at the federal, state, and local levels; and ongoing balancing of resources to optimize population health and ensure reparative interventions for youth with chronic and acute cognitive, affective, and behavioral health conditions.

The first day of the workshop will engage participants in breakout group discussions of how these opportunities and challenges play-out within the sectors of (1) health care (including mental health), (2) schools, and (3) child welfare and juvenile/family justice. Two 1.5 hour sector-based breakout group discussions will be held, each initiated with lead-off panel presentations. The group discussions will center around the following questions:

- How have existing scientific norms, implementation strategies, policies, and practices limited or provided impetus to quality care and improved outcomes for youth at the national, state, and local level? How should we adapt the current norms, strategies, and practices to facilitate broad adoption of prevention that will iteratively improve the quality of American families' lives over time?
- What are key changes that will be needed in financing models, scientific models, policies, and implementation models within the sector in order to broadly implement

evidence-based interventions (be the intervention a practice, program, principle, or strategy)?
- What can be done to foster the creation of linkages across sectors (e.g., education, healthcare, child welfare, justice, and other sectors) to support the implementation and evaluation of preventive interventions for youth?

The second day of the workshop will include summary reports from the chairs of each of the three breakout groups and presentations on and discussion of new methodological directions in prevention science to promote children's cognitive, affective, and behavioral health.

Day 1: Monday, June 16, 2014 (Lecture Room)

8:30 a.m. **Welcome and Workshop Overview**

Mary Jane Rotheram-Borus, Ph.D., Bat-Yaacov Professor of Child Psychiatry and Biobehavioral Sciences, University of California, Los Angeles, Planning Committee Chair

8:45 a.m. **Panel 1: Key System-Level Levers and Blockages to the Broad Implementation of Interventions with Fidelity**

Moderator: Costella Green, M.H.S., Branch Chief, Division of Community Programs, Center for Substance Abuse Prevention, Substance Abuse and Mental Health Services Administration, Planning Committee

Bryan Samuels, A.M., Executive Director, Chapin Hall, University of Chicago; Former Commissioner, Administration for Children and Families (15 min)

Kelly J. Kelleher, M.D., M.P.H., Professor of Pediatrics and Public Health, Colleges of Medicine and Public Health, The Ohio State University; Vice President for Community Health and Services Research, Nationwide Children's Hospital (15 min)

Eric J. Bruns, Ph.D., Associate Professor, Department of Psychiatry and Behavioral Sciences, University of Washington School of Medicine (15 min)

DISCUSSION

9:55 a.m. **Keynote Address: Economics, Policy, and Scaling Interventions for Children's Behavioral Health**

Richard G. Frank, Ph.D., Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services (30 min)

DISCUSSION

10:40 a.m. **BREAK**

10:55 a.m. **Sector-Based Breakout Group Discussion of Themes from Panel 1 and Keynote**

During this session, forum members and workshop attendees will meet in sector-based breakout groups in the areas of **(1) health care (including mental health), (2) schools, and (3) child welfare and juvenile/family justice** to discuss the three questions (listed on the front page of the agenda), building on themes discussed in Panel 1 and in the keynote address.

Breakout group meeting locations and chairs:

Health Care (Including Mental Health) (Room 120)
David Chambers, D. Phil., Associate Director, Dissemination and Implementation Research, Division of Services and Intervention Research, National Institute of Mental Health

Schools (Room 118)
Sheppard Kellam, M.D., Professor Emeritus, Johns Hopkins University

Child Welfare and Juvenile/Family Justice (Members Room)
Larry Palinkas, Ph.D., Albert G. and Frances Lomas Feldman Professor of Social Policy and Health, School of Social Work, University of Southern California

Jennifer Tyson, M.A., Social Science Analyst, Office of Juvenile Justice and Delinquency Prevention, Department of Justice

12:30 p.m. **LUNCH**

1:30 p.m. **Panel 2: The Role of Scientific Norms, Implementation Strategies, and Practices in Care Quality and Outcomes for Youth at the National, State, and Local Level**

Moderator: Wilma Peterman Cross, M.S., Deputy Director, Office of Disease Prevention, National Institutes of Health

Charles Benjamin Collins, Jr., Ph.D., Health Scientist and Team Leader, Science Application, National Center for HIV, STD and TB Prevention, Centers for Disease Control and Prevention (15 min)

Frances M. Harding, Director, Center for Substance Abuse Prevention, Substance Abuse and Mental Health Services Administration (15 min)

Alex R. Kemper, M.D., M.P.H., M.S., Professor of Pediatrics, Duke University School of Medicine (for USPSTF) (15 min)

DISCUSSION

2:40 p.m. **BREAK**

2:55 p.m. **Sector-Based Breakout Group Discussion of Themes from Panel 2**
Forum members and workshop attendees will return to the sector-based breakout groups to continue the discussion of the three questions (listed on the front page of the agenda), building on themes discussed during the morning and afternoon presentations.

4:30 p.m. **Preview of Agenda for Day 2**

Mary Jane Rotheram-Borus, Ph.D., Bat-Yaacov Professor of Child Psychiatry and Biobehavioral Sciences, University of California, Los Angeles, Planning Committee Chair

4:45 p.m. **Adjourn for Day**

Day 2: Tuesday, June 17, 2014 (NAS 120)

8:30 a.m. **Welcome**

Mary Jane Rotheram-Borus, Ph.D., Bat-Yaacov Professor of Child Psychiatry and Biobehavioral Sciences, University of California, Los Angeles, Planning Committee Chair

8:35 a.m. **Summary Reports from Sector Breakout Groups**

Health Care (Including Mental Health)
David Chambers, D.Phil., Associate Director, Dissemination and Implementation Research, Division of Services and Intervention Research, National Institute of Mental Health (15 min)

Schools
Sheppard Kellam, M.D., Professor Emeritus, Johns Hopkins University (15 min)

Child Welfare and Juvenile/Family Justice
Larry Palinkas, Ph.D., Albert G. and Frances Lomas Feldman Professor of Social Policy and Health, School of Social Work, University of Southern California

Jennifer Tyson, M.A., Social Science Analyst, Office of Juvenile Justice and Delinquency Prevention, Department of Justice (15 min)

DISCUSSION

10:15 a.m. **BREAK**

10:30 a.m. **Keynote Address: Putting More Evidence in Evidence-Based Practice: Designing Informed and Efficient Children's Mental Health Systems**

Bruce F. Chorpita, Ph.D., Professor, Clinical Psychology, University of California, Los Angeles; President, PracticeWise, LLC (30 min)

DISCUSSION

11:15 a.m. **Panel 3: New Methodological Directions**

Moderator: Hendricks Brown, Ph.D., Professor, Departments of Psychiatry, Behavioral Sciences, and Preventive Medicine, Northwestern University, Planning Committee

Naihua Duan, Ph.D., Professor of Biostatistics in Psychiatry (retired), Division of Biostatistics, Department of Psychiatry, Columbia University (15 min)

David C. Mohr, Ph.D., Director, Center for Behavioral Intervention Technologies, Department of Preventive Medicine, Northwestern University (15 min)

DISCUSSION

Discussion may focus on how cross-cutting themes emerging from the presentations relate to sector-specific issues from day 1, possibly including

- Monitoring for behavior change and quality improvement
- Funding public health promotion of universal prevention
- Partnerships necessary for implementation
- Creating EBIs that leverage technology
- Identifying when and how implementation of evidence-based practices, programs, strategies, or structural interventions is appropriate

12:20 p.m. **Closing Remarks**

Mary Jane Rotheram-Borus, Ph.D., Bat-Yaacov Professor of Child Psychiatry and Biobehavioral Sciences, University of California, Los Angeles, Planning Committee Chair

12:30 p.m. **Adjourn Workshop**

Workshop Planning Committee

Mary Jane Rotheram-Borus, Ph.D. (*Chair*), University of California, Los Angeles
William R. Beardslee, M.D., Harvard Medical School and Boston Children's Hospital
C. Hendricks Brown, Ph.D., Northwestern University
David A. Chambers, D.Phil., National Institute of Mental Health
Costella Green, M.H.S., Substance Abuse and Mental Health Services Administration
Lawrence A. Palinkas, Ph.D., University of Southern California
Jennifer Tyson, M.A., Office of Juvenile Justice and Delinquency Prevention

Appendix C

Biographies of Workshop Speakers

Eric J. Bruns, Ph.D., is a clinical psychologist and Associate Professor in the Department of Psychiatry and Behavioral Sciences, University of Washington School of Medicine. Dr. Bruns' research and other professional activities focus on public child-serving systems, and how to maximize their positive effects on youth with behavioral health needs and their families. He is nationally known for his research and development work on integrated care coordination for youth with complex mental health needs via the wraparound process and school mental health services. With Eric Trupin, Ph.D., he co-directs the Washington State Children's Evidence-based Practices Institute (www.uwhelpingfamilies.org) and also serves as Associate Director of the UW School Mental Health Assessment, Research, and Training (SMART) Center. He has served as Principal Investigator for more than 10 federally funded studies of community and school mental health services and authored more than 70 refereed journal articles and book chapters.

David Chambers, D.Phil., is currently the Branch Chief of the Services Research and Clinical Epidemiology Branch (SRCEB) of the Division of Services and Intervention Research at the National Institute of Mental Health (NIMH). Since 2001, Dr. Chambers has led the Dissemination and Implementation Research Program within SRCEB, where he continues to manage a portfolio of grants that study the integration of scientific findings and effective clinical practices in mental health within real-world service settings. Since 2006, he has also served as Associate Director for Dissemination and Implementation Research, leading National Institutes of Health (NIH) initiatives around the coordination of dissemination and implementation research in health, including a series of annual conferences, training programs, and set of research funding opportunities. His work has focused on how change occurs in clinical practice, how new practices are introduced into real-world clinical settings, and how health information is disseminated to multiple audiences. Prior to his arrival at NIMH, David worked as a member of a research team at Oxford University, where he studied national efforts to implement evidence-based practice within health care systems.

Bruce Chorpita, Ph.D., is Professor of Psychology at University of California, Los Angeles (UCLA) and President of PracticeWise, LLC. His work is aimed at improving the effectiveness of mental health service systems for children through innovation in treatment design, clinical decision-making and information-delivery models, and system architecture. Recent work has focused on designing treatments that can adapt in real time to local contexts and to emergent youth and family needs while staying grounded in scientifically tested procedures. Other recent work has focused on how service systems can more easily and efficiently prepare a service array to address the needs of the community, and how to sustain effective practice through professional development activities, innovative supervision models, and performance feedback systems. Over the past 10 years, he has led multiple large-scale reform initiatives in public mental health systems throughout the country, increasing both the efficiency and effectiveness of those systems.

Charles B. Collins, Jr., Ph.D., is the Team Leader for the Science Application Team in the Capacity Building Branch of the Centers for Disease Control and Prevention's (CDC's) Division of HIV/AIDS Prevention. His team of scientists are responsible for the dissemination of evidence-based behavioral interventions into HIV prevention practice. His team has disseminated 31 evidence-based interventions designated as having the highest evidence of efficacy for HIV prevention. Over the past 12 years, these interventions have been disseminated to more than 3,900 community-based prevention agencies; to more than 900 city, county, and state health departments; and to more than 1,100 medical clinics. He has designed, implemented, and evaluated an HIV intervention for African American drug users and a multisite community-level intervention for young men who have sex with men (MSM) of color. He has also conducted evaluability assessments and evaluations in community-based organizations. Dr. Collins has published in *AIDS Education and Prevention*, *AIDS Care*, *The Journal of Public Health Management and Practice*, *The Journal of Evaluation and Program Planning*, *The Journal of Alcohol and Drug Education*, *Public Health Reports*, *The Southern Medical Journal*, *American Journal of Community Psychology*, *Evaluation*, and *Psychological Reports*.

Naihua Duan, Ph.D., is an accomplished practicing biostatistician with research interests in implementation research, quality improvement investigations, health services research, prevention research, sample design and experimental design, model robustness, transformation models, multilevel modeling, nonparametric and semi-parametric regression methods, and environmental exposure assessment. He has published more than 190 papers in leading journals in statistics, psychiatry, public health, and epidemiology. He is an elected fellow of the American Statistical Association and the Institute of Mathematical Statistics, and a former associate editor for the *Journal of the American Statistical Association*. He received the Long-Term Excellence Award in 2013 from the Health Policy Statistics Section of the American Statistical Association. Dr. Duan received a B.S. in mathematics from National Taiwan University, an M.A. in mathematical statistics from Columbia University, and a Ph.D. in statistics from Stanford University. He retired in 2012 from Columbia University (CU) and the New York State Psychiatric Institute (NYSPI), where he served as Professor of Biostatistics (in Psychiatry), with tenure, in the Departments of Psychiatry and Biostatistics (CU), and the Director of the Division of Biostatistics (NYSPI). Prior to his tenure at CU/NYSPI, he served as Professor in Residence at UCLA, and led the Methods Core in the Center of Community Health (CCH), the Center for HIV Identification, Prevention, and Treatment Services (CHIPTS), and the Health Services Research Center (HSRC).

Richard G. Frank, Ph.D., is the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services. Previously he was the Margaret T. Morris Professor of Health Economics in the Department of Health Care Policy at Harvard Medical School. From 2009 to 2011 he served as the Deputy Assistant Secretary for Planning and Evaluation at HHS directing the office of Disability, Aging and Long-Term Care Policy. His research is focused on the economics of mental health and substance abuse care, long-term care financing policy, and disability policy. Dr. Frank is also a Research Associate with the National Bureau of Economic Research. He also serves as an editor for the *Journal of Health Economics*. Dr. Frank was awarded the Georgescu-Roegen prize from the Southern Economic Association, the Carl A. Taube Award from the American Public Health Association, and the Emily Mumford Medal from Columbia University's Department of Psychiatry. In 2011 he received the Distinguished

Service Award from the Mental Health Association of Maryland. Dr. Frank received the John Eisenberg Mentorship Award from National Research Service Awards. He was elected to the Institute of Medicine in 1997. He is co-author with Sherry Glied of the book *Better But Not Well* (Johns Hopkins Press, 2008).

Frances M. Harding serves as Director of the Substance Abuse and Mental Health Services Administration's (SAMHSA's) Center for Substance Abuse Prevention (CSAP), and is recognized as one of the nation's leading experts in the field of alcohol and drug policy. CSAP provides national leadership in the federal effort to prevent alcohol, tobacco, and drug problems. As part of an Executive Leadership Exchange in SAMHSA, Director Harding served as Director of SAMHSA's Center for Mental Health Services (CMHS) from July 2010 to January 2011. CMHS leads federal efforts to treat mental illnesses by promoting mental health and by preventing the development or worsening of mental illness when possible. Director Harding serves as the lead for SAMHSA's Strategic Initiative on Prevention of Substance Abuse and Mental Illness, which creates communities where individuals, families, schools, faith-based organizations, and workplaces take action to promote emotional health and reduce the likelihood of mental illness, substance abuse, including tobacco, and suicide. Prior to federal service, Director Harding served as Associate Commissioner of the Division of Prevention and Recovery at the New York State Office of Alcoholism and Substance Abuse Services, where she was responsible for the development of policy and guidelines for alcohol and drug abuse and gambling prevention, treatment, and recovery programming.

Sheppard G. Kellam, M.D., is a public health psychiatrist, and Professor Emeritus at John Hopkins. He played a major role in establishing concepts and methods for prevention science, as well as contributing to knowledge about early risk factors and their malleability. In partnership with the Baltimore City Public Schools System he led three generations of large-scale epidemiologically based randomized field trials supported by National Institute on Drug Abuse (NIDA), NIMH, and National Institute of Child Health and Human Development (NICHD), testing universal preventive interventions in first- and second- grade classrooms directed at early antecedents of long-term problem outcomes. Dr. Kellam worked extensively on early population-based universal intervention studies in Woodlawn, an African American community on the South Side of Chicago, mapping the variation in developmental paths leading to health or disorders in defined populations. From 1982 to 1993 Dr. Kellam was Chair of the Department of Mental Hygiene (now the Department of Mental Health) in the Johns Hopkins Bloomberg School of Public Health and was the Founding Director of the NIMH Hopkins Prevention Research Center. Dr. Kellam later moved to the American Institutes for Research (AIR), where his mission was to develop a new Center for Integrating Education and Prevention Research in Schools (Ed/Prev). Dr. Kellam is a Distinguished Life Fellow of the American Psychiatric Association and was President of the Society for Prevention Research from 1998-2001. In 1996 Dr. Kellam was awarded the Rema Lapouse Award for lifetime contributions to public health and prevention science by the Mental Health, Epidemiology, and Statistics Sections of the American Public Health Association. The World Federation for Mental Health presented Dr. Kellam with the Distinguished Public Mental Health Award in 1999 and in 2004 he was elected a Fellow of the Academy of Experimental Criminology. In 2008 he was awarded the Presidential Award of the Society for Prevention Research and the NIDA Director's Special Appreciation Award for contributions to prevention science.

Kelly Kelleher, M.D., M.P.H., is Professor of Pediatrics and Public Health in the Colleges of Medicine and Public Health at The Ohio State University, Vice President of Community Health and Services Research at Nationwide Children's Hospital, and Center Director in the Center for Innovation in Pediatric Practice at The Research Institute at Nationwide Children's Hospital in Columbus, Ohio. He is a pediatrician and health services researcher focused on improving and measuring the quality of pediatric care for high-risk children affected by social determinants of health, violence, neglect, alcohol, drug use, or mental disorders. He has been continuously funded by NIH since shortly after completing his training in 1990 and is now the principal investigator on projects from Agency for Healthcare Research and Quality (AHRQ) and Centers for Medicare & Medicaid/Center for Medicare & Medicaid Innovation (CMS/CMMI). He is involved in strategy development for the Nationwide Children's Healthy Neighborhood, Healthy Family zone.

Alex R. Kemper, M.D., M.P.H., M.S., is Professor of Pediatrics at Duke University. Dr. Kemper is a health services researcher who focuses on issues related to the delivery of preventive services. He is a member of the U.S. Preventive Services Task Force and serves as the Chair of the Evidence Review Workgroup of the U.S. Secretary of Health and Human Services Discretionary Advisory Committee on Heritable Disorders in Newborns and Children. In addition to these activities, Dr. Kemper serves as Deputy Editor for *Pediatrics*. Dr. Kemper completed his pediatric residency training at Duke University and then fellowship training at the University of North Carolina. In 2000, Dr. Kemper joined the faculty at the University of Michigan. During the next 6 years, Dr. Kemper developed an active research program evaluating lead poisoning prevention strategies, screening for vision and hearing impairment, and the detection of genetic conditions in early childhood. In 2006, Dr. Kemper returned to Duke University.

David C. Mohr, Ph.D., is a professor in the Northwestern University Feinberg School of Medicine's Departments of Preventive Medicine, Psychiatry, and Medical Social Sciences, and is the Director of Northwestern University's Center for Behavioral Intervention Technologies (CBITs; cbits.northwestern.edu). Dr. Mohr has long been interested in telemental health, having conducted seminal research on the use of telephone-administered psychotherapy. In recent years, his work has been at the intersection of behavioral science, technology, and clinical intervention research, where he is developing, optimizing, and evaluating interventions that harness Web-based and wireless technologies to promote health and mental health. He has overseen the creation of an extensible, modular infrastructure, called "Purple," that now supports development of Web-based and mobile intervention tools. Purple now supports more than 50 funded projects around the United States and in developing countries. His current research includes the following projects: (1) the development a context-sensing mobile application that harnesses indwelling phone sensor data (Global Positioning System [GPS], Bluetooth, accelerometry, etc.) to identify specific geographic, activity, social, and emotional patient states that can be incorporated into mobile interventions for depression; (2) the integration of Web-based intervention and peer-networking tools that use principles of online collaborative learning and supportive accountability to enhance learning and adherence; and (3) the integration of intervention technologies into mental health and primary care settings to improve the effectiveness and cost-effectiveness of care. Dr. Mohr is also interested in developing new methodologies for the

evaluation of psychological and behavioral interventions that address the unique needs and rapidly changing technological environment of behavioral intervention technologies.

Lawrence Palinkas, Ph.D., is the Albert G. and Frances Lomas Feldman Professor of Social Policy and Health and director of the Behavioral Health Research Cluster at the University of Southern California (USC) School of Social Work. He also holds secondary appointments as professor in the departments of anthropology and preventive medicine at USC and as adjunct professor of medicine and family and preventive medicine at the University of California, San Diego. A medical anthropologist, his primary areas of expertise lie within preventive medicine, cross-cultural medicine and health services research. Palinkas is particularly interested in behavioral health, global behavioral health and health disparities, implementation science, community-based participatory research, and the sociocultural and environmental determinants of health and health-related behavior with a focus on disease prevention and health promotion. His research has included studies of psychosocial adaptation to extreme environments and manmade disasters; mental health needs of older adults; cultural explanatory models of mental illness and service utilization; HIV and substance abuse prevention in Mexico; evaluation of academic-community research practice partnerships; and the dissemination and implementation of evidence-based practices for delivery of mental health services to children, adolescents, and underserved populations. This work has been funded by the National Science Foundation, National Aeronautics and Space Administration (NASA), NIH, the MacArthur Foundation, and the William T. Grant Foundation. His current research encompasses mental health services, immigrant health, and global health. He also provides expertise to students and colleagues in the use of qualitative and mixed research methods. He is also the author of more than 300 publications. Dr. Palinkas has served on numerous National Academies' committees, including Committee to Review the Federal Response to the Health Effects Associated with the Gulf of Mexico Oil Spill; Committee on NASA's Bioastronautics Critical Path Roadmap; U.S. National Committee for Scientific Committee on Antarctic Research; Committee on Space Biology and Medicine; Decadal Survey on Physical and Biological Sciences in Space; and the Committee on Ethics Principles and Guidelines for Health Standards for Long Duration and Exploration Spaceflights.

Bryan Samuels, M.A., is the Executive Director of Chapin Hall, one of the nation's leading research and policy centers focused on improving the well-being of children and youth, families, and their communities. Before joining Chapin Hall, Samuels was appointed by President Barack Obama as Commissioner of the Administration on Children, Youth and Families (ACYF), making him from 2010-2013 the highest-ranking federal child welfare policy maker in the country. As ACYF Commissioner, he emphasized the importance of child well-being and the use of data-driven approaches to improve the welfare of vulnerable children and youth. Samuels has more than 20 years of experience in child welfare, including having served as the Chief of Staff of Chicago Public Schools under Arne Duncan and as Director of the Illinois Department of Children and Family Services. He was also a lecturer at the University of Chicago's School of Social Service Administration from 1997 to 2003. He has a bachelor's degree in economics from the University of Notre Dame and a master's degree from the University of Chicago Harris School of Public Policy.

Jennifer Tyson, M.A., is a Social Science Analyst in the Office of Juvenile Justice and Delinquency Prevention's (OJJDP's), Innovation and Research Division at the Department of Justice. Prior to joining OJJDP, she served as a coordinator for a national training and technical assistance project at American University and as a program coordinator for a community-based crime prevention and public safety effort in the Office of the Attorney General, Commonwealth of Massachusetts. Ms. Tyson holds a B.A. in Philosophy and Psychology from Boston University and an M.A. in Child Development and Urban Policy and Planning from Tufts University.