The Preemie-to-PreK (P2P) System: Tools for Equitable Early Childhood Outcomes

Developed by the UNC Systems Strengthening Hub for Public Health and UNC Equity Research Action Coalition

EQUITY RESEARCH ACTION COALITION

UNC Frank Porter Graham Child Development Institute

SYSTEMS STRENGTHENING HUB

For Public Health

ABOUT THIS WORK

This report was developed by two University of North Carolina-affiliated groups.

The Systems Strengthening Hub for Public Health is dedicated to advancing the capacity and resilience of public health systems through innovative and collaborative systems-informed approaches. The Hub supports communities and organizations in navigating complex public health challenges by fostering learning, partnership, and coordinated action to improve health outcomes. Its work is grounded in system dynamics, collaboration science, and decision support science, with an emphasis on translating insight into coordinated action and measurable impact.

The Equity Research Action Coalition (ERAC) focuses on co-constructing with practitioners and policymakers actionable research and evaluation to support the optimal development of Black children prenatally through childhood across the African diaspora. ERAC works at the intersection of research, program, and practice through anti-racist and cultural wealth frameworks. ERAC focuses on developing a science-based action framework to eradicate the impact of racism and poverty and all their consequences on the lives of Black children, families, and communities, ensuring their optimal health and well-being.

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INTRODUCTION

Every year in the United States, approximately 1 in 10 infants is born prematurely, with disproportionate rates among Black families and families living in poverty (Cordova-Ramos et al., 2026; March of Dimes, 2024). Preterm and low birthweight (LBW) infants face elevated risks of developmental delay, chronic health conditions, and learning challenges that extend well into childhood. For many families, these challenges are compounded by systemic inequities, including structural racism, economic barriers, and unequal access to high-quality care and support. As a result, infants from historically marginalized communities frequently experience worse outcomes despite having similar needs.

Improving outcomes for preterm and LBW infants and their families requires more than any single program, provider, or policy can offer, it demands a coordinated, equitable system of care that spans hospitals, homes, communities, and schools. Yet that system, as it currently exists, is fragmented, inequitably resourced, and difficult for families to navigate.

The UNC Systems Strengthening Hub for Public Health, in partnership with the UNC Equity Research Action Coalition, developed two **systems thinking tools to help practitioners and policymakers understand and strengthen the P2P system**, the web of actors, programs, policies, and conditions that shape outcomes for premature and LBW infants from birth through age 8, across five key sectors: the NICU, home and community, primary care and medical home, early intervention, and education.

This report introduces the P2P Iceberg Model and the P2P Ecosystem Map, and explains how they can be used to support systems-informed planning, advocacy, and cross-sector collaboration to advance equitable outcomes. It is intended for practitioners and policymakers working in any of the sectors that touch the lives of preterm and LBW infants and their families. The report begins with a brief overview of the methods used to develop the tools, followed by an in depth walk through of each tool, priority action areas, and an invitation to collaborate.

METHODS

Developing the P2P Iceberg Model and Ecosystem Map

These tools were developed through a structured process grounded in peer-reviewed and organizational literature, qualitative analysis, and insight from a national expert convening.

The process began with a **literature review** addressing two questions: What challenges are specific to preterm and LBW infants, and what has been or needs to be done to support equitable outcomes? The review included 8 organizational and 23 peer-reviewed sources meeting criteria related to U.S. context, postpartum through early childhood focus, and relevance to infant or child outcomes. Four team members conducted analysis across four stages: initial extraction, codebook development, structured coding, and cross-coder review. This process yielded 600 coded excerpts, including 265 identifying challenges and 335 identifying needs or interventions.

Challenge codes were thematized using the Iceberg Model framework and organized into four interrelated stories. Needs and intervention codes were inductively thematized, assigned relevant actors, and visualized in an Ecosystem Map.

Findings from the review were then refined and expanded through a **P2P workshop with 24 cross-sector national experts** including researchers, clinical leaders, policy strategists, early childhood specialists, and community and family advocates. Their feedback helped to validate the tools, surface gaps, and inform ongoing refinement.

BUILDING A SHARED UNDERSTANDING OF THE P2P SYSTEM

A system is a group of interdependent parts forming a unified whole with a specific purpose (Kim, 1999). **The P2P system is a web of sectors, actors, policies, and programs that shape outcomes for premature and LBW infants, their families, and the broader community.** Understanding and strengthening the P2P system requires looking beyond individual programs or providers to see how the parts interact, where gaps and misalignments exist, and what underlying forces maintain inequitable outcomes. Systems thinking gives practitioners and policymakers tools to "see the system". Rather than responding to surface-level symptoms, systems thinking helps us trace outcomes back to their structural roots and identify the highest-leverage opportunities for change.

The following systems tools offer complementary perspectives on the P2P system.

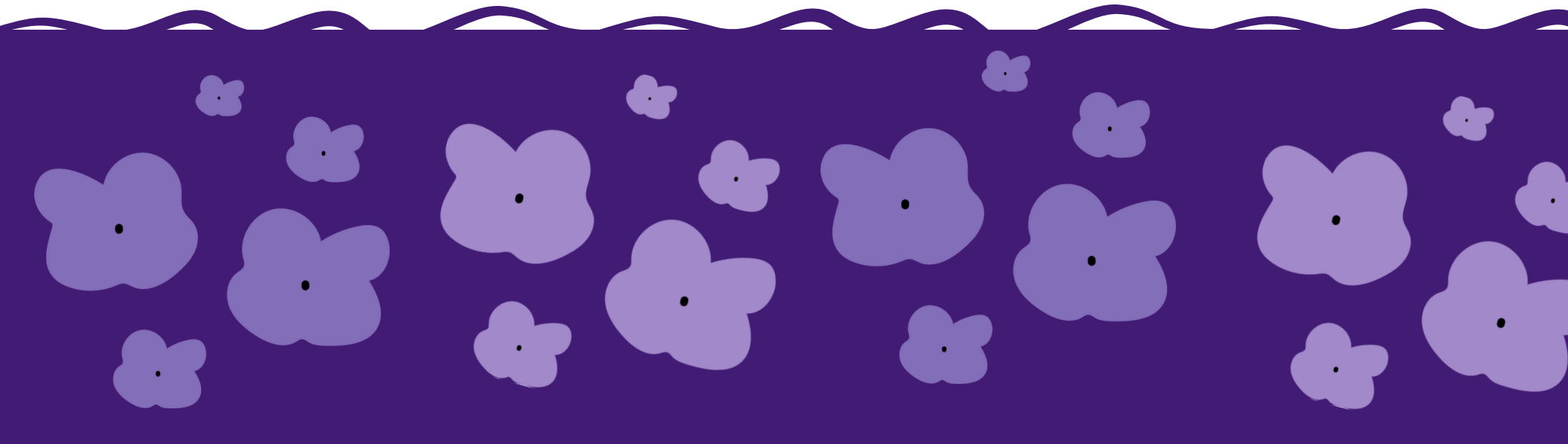
- **The P2P Iceberg Model** examines the events, trends, system structures, and mental models (i.e., mindsets) that contribute to inequitable outcomes. It surfaces four key stories - Cumulative Disadvantage, Family Care Navigation Burden, Missed Opportunities in Early Intervention, and Health System Under Pressure - that highlight the root causes and reinforcing dynamics that shape outcomes across the P2P system.

- **The P2P Ecosystem Map** illustrates the programs, services, policies, cross-cutting conditions, and shared mental models that support children and families across the birth-to-age-8 continuum. It's organized across five interconnected domains: NICU, Home and Community, Primary Care and Medical Home, Early Intervention, and Education.

Together, these tools provide a foundation for understanding the complexity of the P2P system, systemic barriers that sustain inequitable outcomes, and opportunities for more coordinated action to advance equity.

TOOL 1

The Preemie-to-PreK Iceberg Model



WHAT IS THE ICEBERG MODEL FOR SYSTEMS THINKING?

The Iceberg Model is a systems thinking framework that organizes barriers to change into four levels, arranged from the most visible and easiest to address, to the most deeply embedded and difficult to shift.

Events: The observed outcomes and symptoms of underlying system problems that form the "tip of the iceberg." In the P2P context, these include outcomes such as high rates of preterm birth among Black families, delayed access to early intervention services, and developmental disparities at school entry. Events are the most visible, but the least powerful point of intervention when addressed alone.

Trends: The patterns in events over time and across populations. For preterm and LBW infants, relevant trends include increased demand for early intervention combined with budgets cuts, rising healthcare workforce shortages, and a growing mismatch between families' needs and available supports.

System Structures: The policies, infrastructure, rules, resources, and entrenched practices within health and social systems that drive patterns and events, such as inequitable access to economic and social supports for low-income and minoritized families, fragmentation across systems, and persistent resource gaps.

Mental Models: The societal, organizational, and individual attitudes, beliefs, assumptions, and values that underpin system structures and sustain the status quo, such as the prioritization of medical interventions over community-based approaches, implicit bias, and limited recognition of social determinants of health and structural racism as drivers of preterm birth and developmental outcomes.

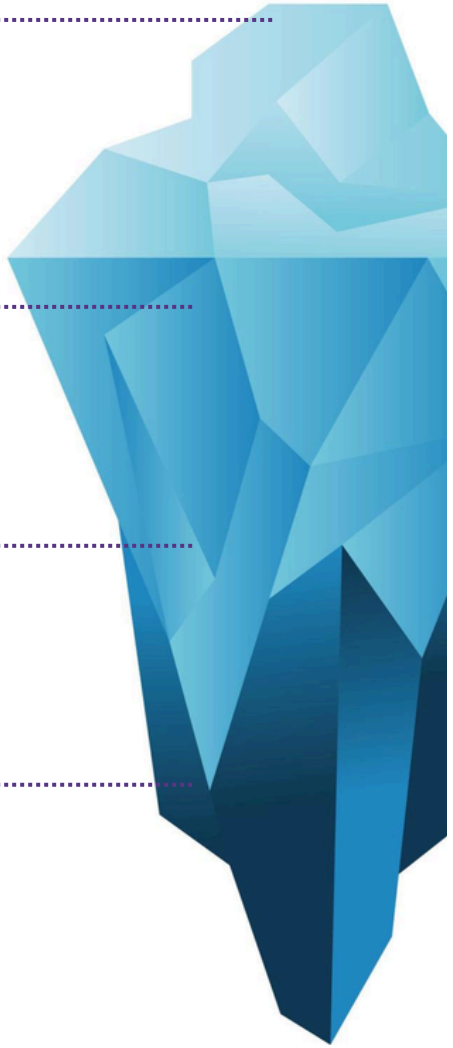


Image Source: Vecteezy

THE FOUR P2P ICEBERG "STORIES"

The P2P Iceberg captures insights on the barriers that perpetuate inequitable outcomes and limit our efforts to advance birth equity for premature and low birthweight infants, and helps to define and understand the problem from a systems perspective, which is the first step towards collectively strategizing to shift structures and transform mental models. **The P2P Iceberg Model organizes barriers into four interrelated narratives, each reflecting a distinct, but interconnected challenge within the P2P system.**

CUMULATIVE DISADVANTAGE

Systemic inequities and structural racism create compounding disadvantages that begin before birth and widen developmental gaps for preterm infants from marginalized communities.

FAMILY CARE NAVIGATION BURDEN

Fragmented healthcare, social service, and education systems force families to navigate complex, uncoordinated services while managing the demands of caring for a preterm or LBW infant.

MISSED OPPORTUNITIES IN EARLY INTERVENTION

Gaps in screening, restrictive eligibility criteria, and poor coordination between medical and early intervention systems prevent families from fully accessing available developmental support.

HEALTH SYSTEM UNDER PRESSURE

Healthcare workforce shortages, fragmented care delivery, and inadequate infrastructure strain the ability of health systems to provide coordinated, family-centered care for preterm infants.

The appendix walks through each story in detail, presenting the specific events, trends, system structures, and mental models that maintain inequitable outcomes for infants born premature and LBW and their families.

HOW TO USE THE P2P ICEBERG

The P2P Iceberg Model can be used in several ways depending on your role and context:

01 **Surface leverage points and gaps:** Use the four iceberg "stories" and levels (events, trends, system structures, and mental models) to locate where your organization or system is currently intervening and identify whether deeper leverage points are being overlooked.

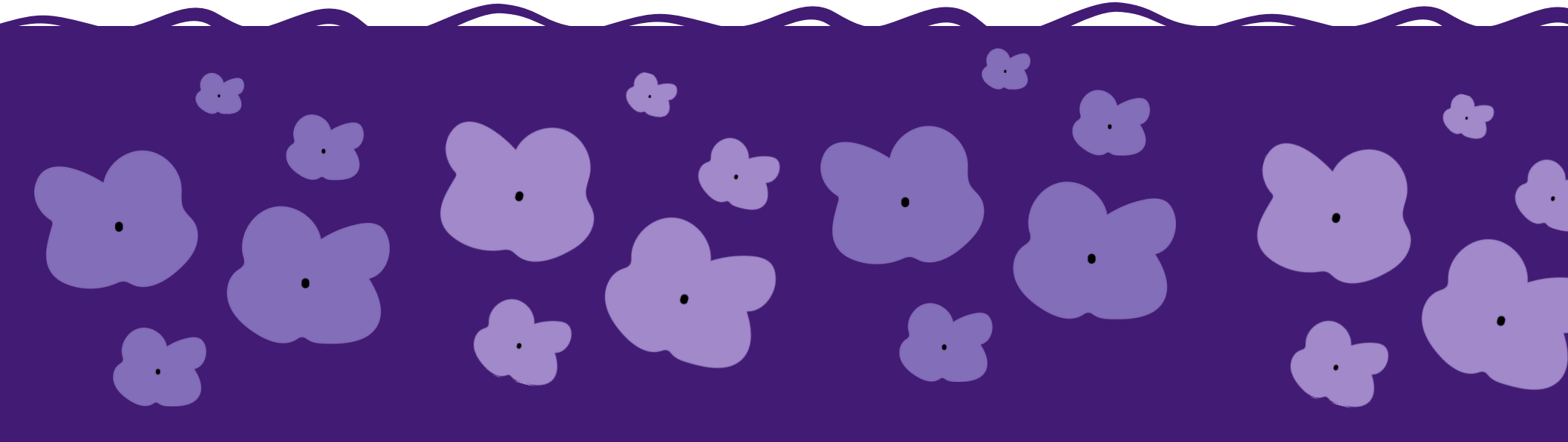
02 **Frame strategy around system conditions:** Ground strategic initiatives in the system structures and mental models driving the problem, rather than focusing solely on event-level responses.

03 **Align partners around root causes:** Use the four "stories" to build shared understanding across sectors about the root causes of inequitable outcomes and galvanize collective action to shift the underlying system conditions.

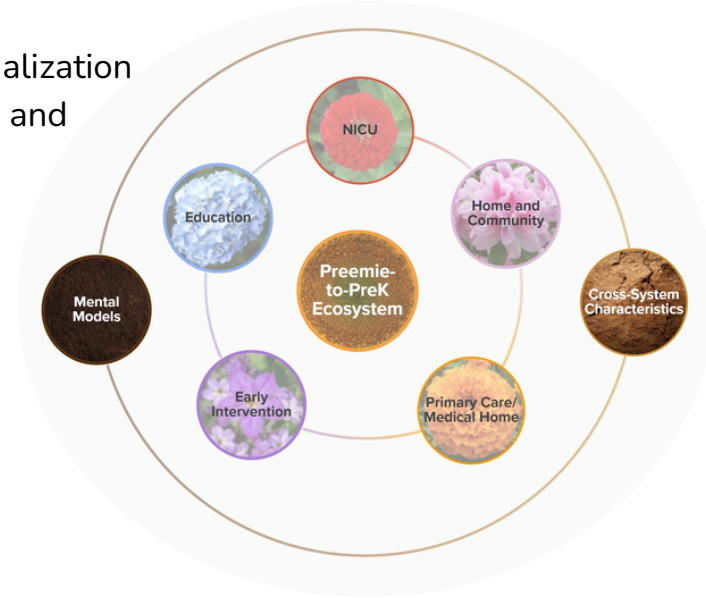
*"The systems were designed to do exactly what they're doing... **The moment to reimagine and revolutionize the system is now**... an opportunity to be bold and visionary and start thinking about what a new system could look like that is actually equitable, compassionate, and truly serves the needs of the families in a way that has never happened before."*
- P2P Workshop Participant

TOOL 2

The Preemie-to-PreK Ecosystem Map



WHAT IS THE PREEMIE-TO-PREK ECOSYSTEM MAP?



The P2P Ecosystem Map **(bit.ly/P2Pecosystem)** is an interactive, holistic visualization of the factors and conditions needed to achieve positive outcomes for preterm and LBW infants from birth through age 8.

Where the Iceberg surfaces what is holding the system back, the **Ecosystem Map illuminates what a well-functioning system would look like**. It is designed to help cross-sector partners "see the system" in its entirety, identify gaps and redundancies, and anchor strategic action.

What's in the P2P Ecosystem Map? The Ecosystem Map is organized as a set of concentric rings, each representing a different layer of the system.

Inner Ring: Key Outcomes – The innermost ring captures the core outcomes the P2P system is working toward and what success would look like for preterm and LBW infants and their families across the birth-to-age-8 continuum.

Middle Ring: System Structures – The middle ring is organized by the five domains of the P2P system **(NICU, Home and Community, Primary Care and Medical Home, Early Intervention, and Education)** and the programs, services, policies, practices, and supports within each that make up the functional architecture of the P2P system. These are the levers that, when well-resourced and coordinated, drive progress toward the outcomes in the inner ring.

Outer Ring: Cross-System Characteristics and Mental Models – The outer ring reflects the cross-system characteristics and mental models that shape how the entire system functions. These are the upstream factors that enable or constrain the effectiveness of the programs and policies in the middle ring.

The following pages introduce the individual elements that comprise each layer of the Ecosystem Map and collectively shape the P2P system.

THE P2P ECOSYSTEM MAP

Inner Ring: Key Outcomes

Key Outcome*	What Success Looks Like
Structural Opportunity	Systems, policies, and environments surrounding children and families are designed to produce equitable results regardless of race, ethnicity, or socioeconomic status. Early childhood, health, and education systems produce equitable outcomes, so that a child's developmental trajectory is not predictable by their race, ethnicity, or family income.
Thriving Children	Children reach their full developmental, social-emotional, and educational potential across the first eight years of life. Children are connected to supportive adults and able to participate meaningfully in learning environments, with outcomes that reflect their individual strengths rather than the limitations of the systems meant to serve them.
Effective and Timely Early Intervention	All children who are eligible for early intervention services are identified early, enrolled promptly, and receive high-quality, family-centered services that meaningfully improve their developmental trajectories. No eligible child waits months for services, no family falls through the cracks at discharge, and early intervention is a supportive partnership rather than a bureaucratic hurdle.
Early Childhood Academic Success	Children enter and progress through early schooling with the cognitive, language, social-emotional, and behavioral foundations they need to learn, participate, and thrive alongside their peers. Children are kindergarten-ready, supported by teachers and systems that understand their developmental histories, and whose academic trajectories are not predetermined by the circumstances of their birth or their families' resources.

**Each outcome includes a detailed description and measurement approaches in the interactive ecosystem map.*

THE P2P ECOSYSTEM MAP

Inner Ring: Key Outcomes

Key Outcome*	What Success Looks Like
Health System Coordination & Collaboration	Health, early intervention, education, and community systems surrounding families operate as a coherent, connected ecosystem rather than a set of parallel silos through information sharing, coordinating care, and presenting families with a unified experience. Families experience smooth transitions, and access, timing, and quality of supports are consistent across systems so that variation in eligibility or coordination does not determine outcomes.
Streamlined Care Navigation	Families move through care pathways from the NICU through early intervention, primary care, and community services without bearing the coordination burden alone. Connections to services are built into the architecture of care, with trusted navigators and clear handoffs ensuring no family falls through the gaps regardless of their background or resources.
Supported & Empowered Families	Families feel informed, confident, and equipped to advocate for their children across every system they encounter, from the NICU through early intervention, primary care, and education. Families are treated as essential partners in their child's care, connected to the resources they need, and supported emotionally and practically.

**Each outcome includes a detailed description and measurement approaches in the interactive ecosystem map.*

THE P2P ECOSYSTEM MAP

Middle Ring: System Structures

The map organizes the P2P system into five interconnected domains. Each represents a critical sector of the ecosystem through which preterm and LBW infants and their families move from birth through early childhood.

NICU

The NICU domain describes the neonatal intensive care unit as both a clinical setting and a critical entry point into a broader ecosystem of support for preterm infants and their families. The NICU is where many families first encounter the systems that will shape their child's developmental trajectory, making it a uniquely powerful moment for connection, education, and relationship-building that extends far beyond the hospital stay.

Within the NICU, a well-functioning, equitable P2P system requires action to:*

- Continuously review and update NICU evidence-based discharge policies
- Create supportive NICU work environments and ensure adequate staffing
- Educate providers on infant needs, early intervention services, and referral procedures
- Engage families in parental education and support, including family-centered discharge planning
- Ensure physiologic stability, completion of appropriate primary care, and family preparedness with community support prior to NICU discharge
- Establish multidisciplinary and holistic care teams
- Facilitate NICU peer community-building and support activities
- Implement breastfeeding support policies in NICU
- Implement continuous quality improvement
- Implement flexible NICU family visitation policies
- Optimize NICU nurse assignments to ensure certification levels match infant acuity
- Provide paid family leave and other resources to support time in NICU
- Standardize NICU nurse-to-patient ratios
- Utilize NICU data to inform early childhood service investment

**Each action includes a detailed description, examples, and related resources in the interactive ecosystem map.*

THE P2P ECOSYSTEM MAP

Middle Ring: System Structures

Home and Community

The Home and Community domain describes the supports, services, and environments that surround preterm and LBW infants and their families from NICU discharge through the early childhood years, where most of a child's development takes place. Because the transition from the NICU to home is one of the most vulnerable periods for preterm families, and because the quality of the caregiving environment shapes developmental outcomes as powerfully as clinical care, this domain is central to any serious effort to advance equitable outcomes.

Within Home and Community, a well-functioning, equitable P2P system requires action to:*

- Effectively re-engage families who paused services
- Ensure support for caregiver mental health
- Ensure WIC/SNAP access for eligible families
- Implement structured, evidence-based parenting and early learning interventions
- Implement supportive economic policies for low resource families, including unconditional cash transfers
- Invest in community-based infrastructure and resources to address upstream social determinants of health
- Maximize postpartum Medicaid coverage and utilization to support maternal mental and physical wellbeing
- Promote and support family care-seeking and adherence to treatment
- Provide continuous early developmental support from the NICU through the first years of life
- Provide NICU and home-based feeding support, including evidence-based breastfeeding practices, kangaroo mother care, and caregiver capacity building
- Provide structured hospital-initiated and home-based parenting support
- Provide support for families to create activity-rich, supportive caregiving environments
- Provide targeted community support for preterm infants in poverty

**Each action includes a detailed description, examples, and related resources in the interactive ecosystem map.*

THE P2P ECOSYSTEM MAP

Middle Ring: System Structures

Primary Care & Medical Home

The Primary Care & Medical Home domain describes the role of pediatric primary care providers and multidisciplinary high-risk infant follow-up clinics in delivering the longitudinal, coordinated, and developmentally informed care that preterm and LBW infants often need across the first years of life. The medical home connects families to early intervention, subspecialty services, developmental monitoring, and community supports, and the relationship between families and their primary care provider is one of the most important and sustained relationships in a child's early life.

Within Primary Care & Medical Home, a well-functioning, equitable P2P system requires action to:*

- Coordinate care between early intervention programs and medical homes
- Ensure accessible, plain-language communication of medical information and recommendations
- Establish clear and streamlined follow-up protocols and educate providers on those protocols
- Expand telehealth for follow-up care, especially in underserved areas
- Facilitate early and ongoing neurodevelopmental monitoring across the life course
- Integrate home visiting with center-based medical therapy during the NICU-to-home transition
- Monitor high-risk infants in primary care/multidisciplinary clinics
- Offer paid time off for appointments
- Prioritize parent-defined outcomes in assessment and counseling
- Provide care navigation support

**Each action includes a detailed description, examples, and related resources in the interactive ecosystem map.*

THE P2P ECOSYSTEM MAP

Middle Ring: System Structures

Early Intervention

The Early Intervention (EI) domain describes the system of services and supports available to infants and toddlers from birth through age three who have or are at risk for developmental delays or disabilities. At its best, early intervention meets families where they are, delivering timely, culturally responsive, and family-centered services in the natural environments where children live and learn, and ensuring that every preterm and LBW infant has access to the support their development requires.

Within Early Intervention, a well-functioning, equitable P2P system requires action to:*

- Bolster federal and state support for Part C early intervention programs as an evidence-based solution
- Deliver early intervention services in flexible locations (e.g. home, community, NICU, and remote support)
- Enhance early intervention funding and coordinate statewide service delivery
- Expand and modernize early intervention eligibility and entry criteria to ensure access during critical developmental periods
- Facilitate Medicaid enrollment to support early intervention access
- Grow the early intervention workforce
- Implement collaborative, culturally relevant, family-centered early intervention programs
- Leverage existing data sources to enhance early intervention referrals (e.g., birth registries, newborn screening)
- Proactively build family trust and address misconceptions about EI services
- Promote language-rich, responsive caregiver communication
- Provide early developmental interventions that strengthen the parent-child relationship
- Provide early shared reading and language development support (starting in NICU)
- Provide family education and reassurance on developmental milestones and expectations
- Strengthen data monitoring and tracking to improve early intervention referral outcomes and identify gaps
- Tailor early intervention services to each family's unique context and needs

**Each action includes a detailed description, examples, and related resources in the interactive ecosystem map.*

THE P2P ECOSYSTEM MAP

Middle Ring: System Structures

Education

The Education domain describes the systems, programs, and practices that support the learning, development, and academic success of children born from early childhood through the early elementary years. For many preterm and LBW children, the early childhood and elementary years are where earlier investments in clinical care and intervention pay off, or where gaps in those systems first become visible, making education a critical opportunity to ensure every child reaches their potential.

Within Education, a well-functioning, equitable P2P system requires action to:*

- Conduct early screening to support learning needs for children born LBW/premature
- Disseminate information on Individualized Education Plans to families and providers
- Ensure access to affordable, high-quality early education opportunities
- Implement data sharing between EI programs and schools
- Invest in resources across families, schools, and neighborhoods to reduce educational disparities
- Offer language interventions to improve developmental outcomes
- Provide coordinated services within families' preferred early learning setting
- Restructure success metrics to consider differences in family support systems and cultures
- Support early childhood community-based education programs (e.g., HeadStart)
- Support inclusivity in educational settings
- Train teachers to understand and support premature infant development

**Each action includes a detailed description, examples, and related resources in the interactive ecosystem map.*

THE P2P ECOSYSTEM MAP

Outer Ring: Cross-System Characteristics

Cross-System Characteristics

Cross-System Characteristics describes the **system-wide practices, policies, and structural features** needed across the NICU, home and community, early intervention, primary care, and education settings to ensure that families of preterm and LBW infants experience coordinated, equitable, and responsive care regardless of where they enter the system. These characteristics are not specific to any one setting or provider type; they represent **the connective tissue that holds an equitable P2P ecosystem together.**

Cross-System Characteristics of a well-functioning, equitable P2P system include:*

- Advance value-based payment models that reward whole-person care and outcomes over utilization
- Advocate for policies that address SDOH, paid family leave, racial equity, and disability justice
- Apply a systems thinking approach to strengthen interagency collaboration across early childhood partners
- Build shared accountability for pre-term birth outcomes
- Develop and support a diverse, culturally concordant and competent workforce
- Develop shared data architecture grounded in family data ownership and consent
- Disaggregate data by race, ethnicity, and language
- Equip families to know and exercise their rights
- Establish and maintain clinical-community partnerships to support family medical and social needs
- Establish universal referral platforms
- Implement evidence-based practices (NICU and beyond)
- Invest in climate resilience as maternal and infant health infrastructure
- Invest in research on evidence-based practices to advance medical, developmental, and educational outcomes
- Leverage AI to streamline service access
- Leverage technology to promote shared communication between families and medical, community, and education partners
- Measure family experiences with systems
- Promote community health workers and peer liaisons as culturally concordant navigation and advocacy support for families
- Provide accessible and culturally competent care and services
- Provide inclusive family-centered care
- Provide tailored, integrated support for infant development across home, health, and educational systems
- Screen for social determinants of health needs and connect families to support and referrals
- Support community provider awareness and distribution of information on short and long-term supports for families

**Each characteristic includes a detailed description, examples, and related resources in the interactive ecosystem map.*

THE P2P ECOSYSTEM MAP

Outer Ring: Mental Models

Mental Models

Mental Models are the underlying beliefs, assumptions, and ways of thinking that shape how providers, policymakers, researchers, families, and communities understand and respond to preterm birth and its consequences. Mental models are often invisible as they operate beneath the level of policy and practice, but they are the most powerful drivers of system behavior, determining what gets funded, who gets served, and the quality of care families receive.

Mental Models of a well-functioning, equitable P2P system include:*

- Apply a strengths-based approach to care
- Appreciate that designing for those furthest from access creates universal benefit
- Appreciate the diversity of preterm infant trajectories and the unique needs of subgroups (e.g., very LBW infants)
- Embrace a collective responsibility mindset across providers, programs, and communities to support premature infants
- Embrace a follow-through mindset where providers take responsibility, and are incentivized and held accountable for supporting families beyond clinical encounters
- Embrace a universal goal of thriving families and healthy child development and wellbeing
- Embrace all care as brain care
- Implement NICU collaborative practices to improve equity
- Recognize and uphold the dignity and rights of every family and child served
- Recognize early intervention as essential civic infrastructure, not an optional service
- Recognize parents as partners in the care team whose engagement and behaviors directly shape infant outcomes
- Recognize that developmental surveillance is a long-term commitment, not a one-time screening
- Recognize that disability is a natural part of the human experience
- Recognize the long-term educational, health, and economic benefits associated with early and upstream interventions
- Understand the role of social, structural, and political determinants of health on preterm infant outcomes

**Each mental model includes a detailed description, examples, and related resources in the interactive ecosystem map.*

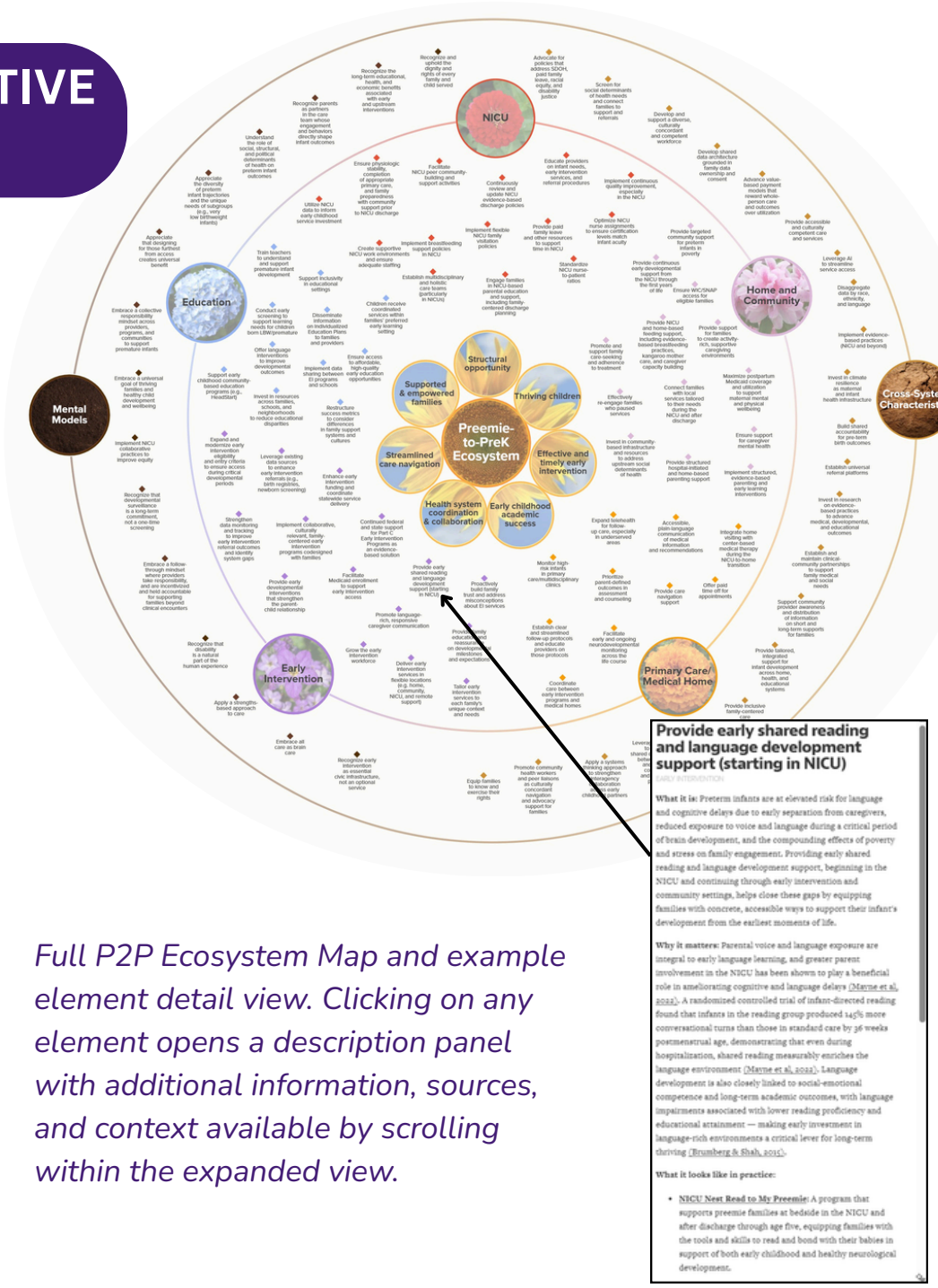
NAVIGATING THE INTERACTIVE P2P ECOSYSTEM MAP

The interactive P2P Ecosystem Map is [available online] and designed to be explored interactively.

To get started:

- **Navigate between pages to explore the full map:** Use the arrows on the right-hand side of the screen or the up and down arrow keys on your keyboard. You can zoom in and out at any time to explore different levels of detail.

- **Select an element to learn more:** Click any circle or diamond on the map to view its description, sources, and supporting information. If the information panel does not open, click the three dots on the left-hand side of the screen (mid-page) to expand it. To close the panel and return to the full map view, click anywhere on the map.

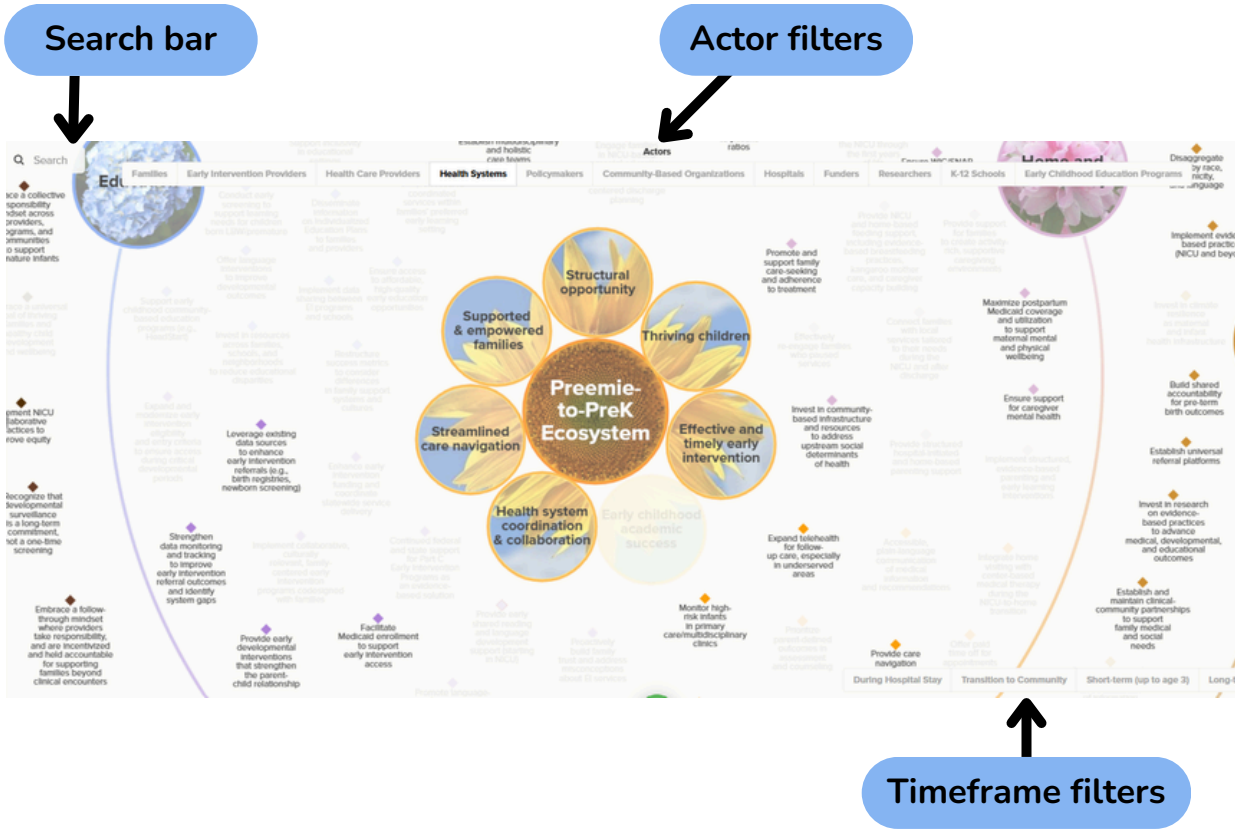


Full P2P Ecosystem Map and example element detail view. Clicking on any element opens a description panel with additional information, sources, and context available by scrolling within the expanded view.

NAVIGATING THE INTERACTIVE P2P ECOSYSTEM MAP (continued)

- **Use filters to focus your view**. Filters allow you to narrow the map to elements relevant to specific actors (Early Intervention, Health Care Providers, Policymakers, Funder, etc.) or timeframes (During Hospital Stay, Transition to Community, Short-Term, or Long-Term). Actor filters are located as buttons along the top of the map and timeframe filters are located on the bottom right. Click any filter button to apply it, and click it again to remove it or return to the full view.

- **Search for specific topics**. Use the search bar (top left) to quickly locate specific programs, policies, or system elements. Type a keyword into the search field, and matching items will be shown. Selecting a result will take you directly to that element.



P2P Ecosystem Map illustrating key navigation tools. Users can refine the view using actor filters at the top of the map and timeframe filters at the bottom, or use the search bar in the upper left to locate specific system elements. In this example, the "Health System" actor filter is applied.

HOW TO USE THE P2P ECOSYSTEM MAP

The P2P Ecosystem Map is intended to help cross-sector partners "see the system" to increase shared understanding of how actors, programs, and policies connect and influence one another, and to translate that understanding into more intentional, coordinated action. Partners can use it to:

01 **Identify gaps and fragmentation across sectors.** Examine where services, supports, and partnerships are missing, disconnected, or duplicative, and identify opportunities to strengthen coordination and continuity of care for children and families.

02 **Anchor strategic planning and systems-informed evaluation.** Guide local, state, or national conversations about priorities, investments, and action strategies, and assess whether programs, policies, and initiatives are strengthening key system elements and advancing equitable outcomes.

03 **Develop consensus around priorities for action.** Facilitate collaborative discussions about system strengths, gaps, and opportunities, helping partners align around shared priorities and collective action to improve outcomes.

04 **Build a shared language and common understanding.** Create a common framework for discussing the P2P system, helping diverse partners understand how their work contributes to outcomes and how it connects with the work of others.

05 **Advocate for systems change.** Use the map to communicate system needs, illustrate connections across sectors, and make the case for upstream investments, policy changes, and coordinated action to advance equitable outcomes.

COLLABORATING TO STRENGTHEN P2P OUTCOMES

A Shared Language for Cross-Sector Action

One of the most important functions of the P2P tools is to create a shared language across sectors that do not always communicate well with one another (e.g., NICU teams, early interventionists, primary care providers, early educators, policymakers, and family advocates). When these actors understand how their work fits into a larger system, collaboration becomes more intentional and more effective. Our national P2P workshop demonstrated what becomes possible when cross-sector experts reflect intentionally about the system as a whole. The action priorities that emerged, summarized below, reflect both the diversity of expertise in the room and a collective sense of urgency about the moment.

Priority Action Areas

P2P workshop participants identified actions across seven priority themes. These are not meant to be exhaustive but to illustrate the range of entry points available to practitioners and policymakers working to strengthen the P2P system.

Awareness and Field Building
Elevate preterm birth as a priority among educators and systems leaders. Connect researchers to awareness campaigns to ensure evidence-based approaches reach the field. Build public understanding of the long-term developmental implications of preterm birth and the systemic conditions that drive disparities.

Cross-Sector Coordination
Translate complex referral processes into clear, accessible family-facing tools. Orient systems change efforts toward the NICU family experience as a central entry point. Amplify state-level policies that model comprehensive, coordinated ecosystem approaches.

PRIORITY ACTION AREAS (continued)

Data, Storytelling, and Accountability
Use workforce analytics to surface inequities and drive funding reform. Build multi-sector equity indices that pair quantitative outcome data with lived-experience narratives from families. Develop shared metrics that hold systems accountable for equitable outcomes.

Paid Leave and Economic Supports
Advocate for paid family and medical leave policies that recognize the extended demands placed on NICU families. Push for childcare assistance for families during and after NICU stays. Engage business and employer communities to expand workplace paid leave options.

NICU-to-EI Transition
Ensure early intervention assessments and Individualized Family Service Plans (IFSPs) are in place before NICU discharge, rather than after. Co-locate EI coordinators within NICUs to strengthen referral pathways and reduce the burden on families to initiate services on their own.

Provider Education and Training
Develop provider education materials focused on EI referral criteria and processes. Create shared professional development opportunities across medical and early intervention providers to build mutual understanding and reduce siloed practice.

Policy and Advocacy
Advocate for increased EI funding and upstream interventions that address social determinants of health. Link social determinant data to infant developmental outcomes to make the case for policy investment. Center families with lived experience of preterm birth, particularly Black families and other historically marginalized communities, in the design and governance of policy decisions.

AN INVITATION TO COLLABORATE

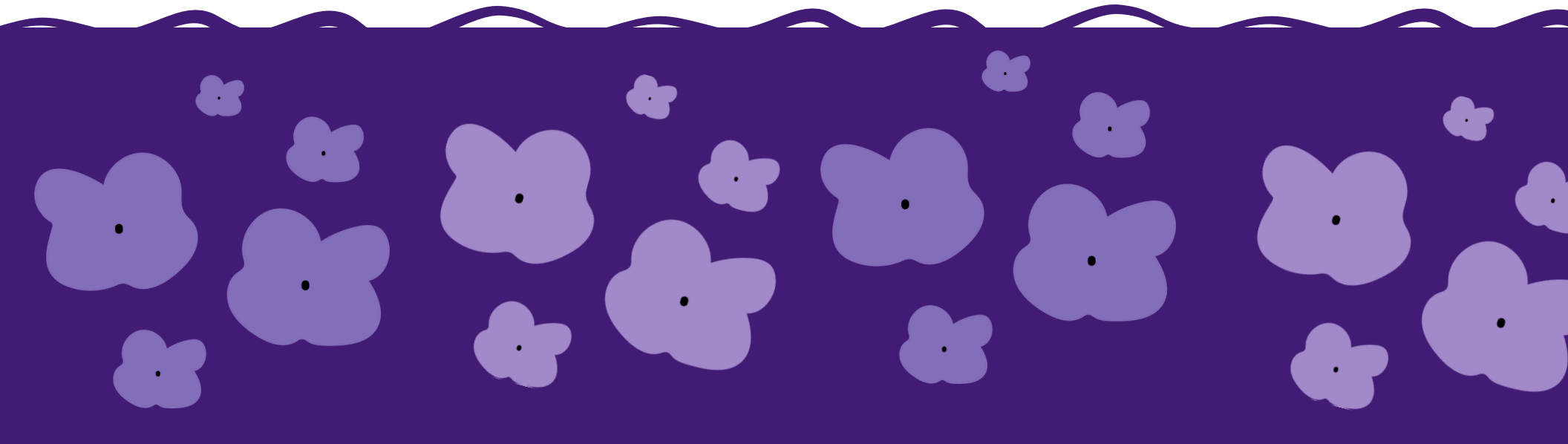
The P2P Iceberg Model and Ecosystem Map are living tools, built to evolve alongside the field they serve. We invite you to engage with these tools in the context of your own work. **Whether you are seeking to diagnose systemic barriers, plan a cross-sector initiative, or build coalition alignment, the P2P team is available to support facilitated sessions tailored to your community or context.**

To set up a 1:1 conversation or group session, or to share additional resources and ideas for inclusion in the next iteration of the tools, please reach out: **systemstrengthening@unc.edu.**

"This ecosystem map shows how much brilliance already exists but also how fragmented the brilliance is. ***What's missing isn't effort, it's integration.*** *Families feel every gap between NICU, early intervention, home, and education because our data, mental models, and funding structures don't yet move as a connected system." - P2P Workshop Participant*

APPENDIX

The P2P Iceberg Stories



The P2P Iceberg: Cumulative Disadvantage (Story 1)

Events:

- Discontinuity in maternal and infant care during the transition home
- Failure to assess and address social determinants of health in medical settings
- Reduced engagement in postpartum and early childhood follow-up care among minority and low-income families

Trends:

- Rising rates of preterm birth and developmental outcomes stemming from poverty, environmental hazards, poor maternal health, and chronic toxic stress
- Widening developmental and educational disparities between preterm children from low- vs. high-SES families as they age
- LBW is a persistent leading cause of infant mortality in the U.S., which has more LBW babies than any other developed nation
- Increasing likelihood of preterm birth, poor maternal health, and lack of access to paid family leave among women of color
- Persistent link between low maternal education and poorer child educational outcomes
- Elevated rates of preterm birth, LBW, NICU admission, and infant mortality among infants of color

System Structures:

- Inaccessible economic and social supports (e.g. paid leave, transportation, nutrition, childcare) for low-income and minority families limits NICU engagement and worsens infant and parental outcomes
- Socioeconomic inequities and structural racism create conditions that expose infants to poverty and ACEs, concentrating risk of preterm birth among low-income minority families
- Socioeconomic resources dictate family ability to cultivate stimulating home environments and access supports (e.g. medical, educational) and opportunities for infants, shaping early childhood experiences and amplifying developmental disparities over time
- Medically-centered care systems address symptoms rather than root causes and social determinants driving preterm disparities
- Structural racism creates resource gaps and inequities in care quality within and across hospitals, worsening outcomes for Black and minoritized infants

Mental Models:

- Medical interventions are prioritized over social, community-based, and family-centered approaches
- Clinician implicit bias produces disparate care quality and outcomes
- Insufficient recognition that social determinants of health are primary drivers of preterm birth risk and developmental outcomes

The P2P Iceberg: Family Care Navigation Burden (Story 2)

Events:

- Incomplete attendance at post-discharge appointments
- Recurrent ED visits or NICU admissions related to care coordination gaps
- Family disengagement from care plans due to logistical and coordination burden
- Delayed initiation of early intervention services despite identified need

Trends:

- Increasing inability of healthcare systems to meet the intensive monitoring, referral, and coordination needs of preterm infants
- Increasing mental health and financial strain on families from NICU hospitalization and infant care
- Persisting high care needs after NICU discharge, including hospital readmission and healthcare utilization
- Increasing uncertainty in identification and delays in response to preterm infants' developmental needs
- Growing mismatch between families' complex caregiving demands and their available resources and support systems
- Healthcare systems struggle to meet the intensive monitoring, referral, and coordination needs of preterm infants

System Structures:

- Prolonged stress of NICU stays and lack of access to lactation consultants during and after NICU stays limits breastfeeding rates
- Barriers (e.g. lack of paid leave, transportation challenges, unwelcoming NICU environments) limit family time in the NICU, reducing bonding and learning opportunities
- High costs of preterm complex care needs (e.g. prolonged hospitalization and ongoing medical care) strain families and health systems
- Lack of integrated mental health, psychosocial, and family-centered care across NICU and post-discharge amplifies family stress and undermines developmental outcomes
- Healthcare delivery relies on primary care for complex monitoring needs without integrated specialty support or co-located services
- NICU staffing constraints and work environments compromise care quality, family education, and staff-family communication

Mental Models:

- Unclear accountability and ambiguity regarding whose job it is to coordinate care for families with preterm infants
- Belief that families are responsible for navigating complex care systems and finding services themselves
- Belief that parents are visitors in the NICU, rather than central caregivers
- Prioritization of medical models of care over family-centered approaches
- Provider assumptions about family capability and readiness drive decisions about discharge timing and service access rather than objective criteria

The P2P Iceberg: Missed Opportunities in Early Intervention (Story 3)

Events:

- Late detection of developmental delays in medical and educational settings despite earlier risk factors
- Eligible children not enrolled in EI services following referral
- Children aging out of eligibility before receiving services

Trends:

- Increased demand for EI services combined with budget cuts and shrinking eligibility criteria exacerbate funding and service gaps (e.g,. premature loss of access to EI services)
- Rising inequities in access to and satisfaction with EI services among low-income, minority, less-educated, and non-English-speaking families
- Persistent difficulty of detection of delays and referral for infants under 1 and LBW babies, limiting early identification and delaying developmental support services
- Compounding medical, cognitive, behavioral, and developmental challenges in preterm infants reduces school readiness and academic achievement
- Declining family engagement with EI services driven by overwhelm, mistrust, and limited EI literacy

System Structures:

- School age cutoffs that don't account for adjusted age of preterm infants disadvantage those who are not yet developmentally ready
- Complex, restrictive, and inconsistent EI eligibility criteria and enrollment processes that vary by state create delay and obstruct referral for eligible infants
- Limited support for parent education and meaningful participation in EI services
- Gaps in awareness and research on the developmental needs and short- and long-term outcomes of preterm infants limit the evidence base for appropriate care and referral
- Limited data collection on the impact of EI for preterm infants limits ability to improve service quality, demonstrate outcomes, and optimize interventions

The P2P Iceberg: Missed Opportunities in Early Intervention (Story 3)

System Structures (continued):

- Unclear roles and role misalignment across medical, community, and education systems create gaps in coordinated support
- Restrictive eligibility and administrative complexity limit preterm infants' access to essential nutrition support (e.g. WIC)
- Language, income, geographic, and other structural barriers limit EI enrollment, access, and satisfaction for minority, rural, low-income, and non-English speaking families
- Limited screening and assessment tools struggle to distinguish disability types, screen before early childhood, detect Autism Spectrum Disorder and motor delays due to symptom overlap with prematurity, and identify late-onset impacts
- Lack of sufficient provider training and supportive infrastructure drives ineffective and biased EI referrals, leaving those with subtler delays unidentified

Mental Models:

- Lack of appreciation for the uniqueness of each child's developmental trajectory
- Insufficient provider understanding of EI referral criteria and processes
- Family belief that EI services are intrusive and/or unnecessary
- Lack of acknowledgment or awareness of long-term benefits and return-on-investment of EI
- Misperception that conditions that are detected later and/or conditions that are not visible are less severe and therefore less "worthy" of EI
- EI eligibility is shaped by a 'fail first' approach to prove need for services

The P2P Iceberg: Health System Under Pressure (Story 4)

Events:

- Discharge without confirmed follow-up appointments or care coordination plans
- Families receiving inconsistent guidance across providers
- Care plans scaled back due to capacity or resource constraints
- Longer NICU stays resulting from lack of home care availability

Trends:

- Lengthening wait times and declining referral success rates for needed services
- Expanding telehealth services, with uneven implementation and inequities in acess
- Increasing medical complexity at NICU discharge, requiring closer and longer-term follow-up
- Rising healthcare utilization among families with preterm infants
- Rising healthcare workforce shortages
- Changing health insurance coverage creates inconsistent access

System Structures:

- Inconsistent use of evidence-based practices in clinical settings
- NICU staffing constraints and work environments compromise care quality, family education, and staff-family communication
- Inaccessible follow-up care in rural and underserved areas (worsened by absence of telehealth)
- Hospital funding, staffing levels, and policies often overlook the needs of families with preterm infants
- Lack of culturally responsive care in NICUs
- Insufficient provider education and training on EI
- Fragmentation of health systems and absence of standardized follow-up and referral protocols limit coordination across healthcare, community services, and early intervention at discharge and beyond
- Provider shortages limit availability of nursing care at home

Mental Models:

- "Watch and wait" mindset delays service access
- Provider assumptions about family capability and readiness drive decisions about discharge timing and service access rather than objective criteria
- Belief that parents are visitors in the NICU, rather than central caregivers
- Scarcity mindset (e.g. resources, staff time) drives health system decision-making
- Belief that NICU parental involvement is a privilege, not a right
- Research and medical care that prioritizes infant clinical outcomes over family-centered outcomes and well-being

Access the P2P Ecosystem Map by scanning the QR code or visiting bit.ly/P2Pecosystem

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