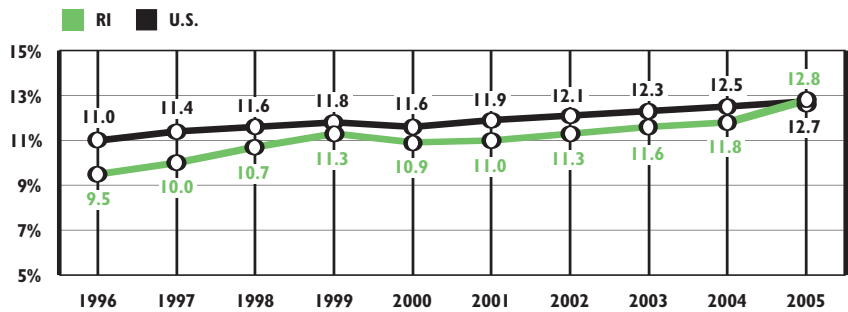


Issue Brief

PRETERM BIRTHS IN RHODE ISLAND

The rate of preterm births (live births before 37 weeks completed gestation) is increasing in the United States and in Rhode Island.<sup>1,2</sup> The preterm birth rate in the U.S. has increased more than 30% over the past two decades, from 9.4% of live births in 1981 to 12.7% in 2005.<sup>3,4</sup> Rhode Island has seen a similar increase, from 9.5% of live births being preterm in 1996 to 12.8% (1 in 8 babies) in 2005.<sup>5,6</sup>

PRETERM BIRTHS  
RHODE ISLAND AND UNITED STATES, 1996-2005



Source: 1996-2004 U.S. data are from the National Center for Health Statistics (NCHS) as reported by *PeriStats* ([www.marchofdimess.com/peristats](http://www.marchofdimess.com/peristats)), 2007. 2005 U.S. data are from NCHS' *Births: Preliminary Data for 2005* ([www.cdc.gov](http://www.cdc.gov)) and all RI data are from the Rhode Island Department of Health, Division of Family Health. Gestational age for RI and the U.S. is determined using estimated last menstrual period as reported by the mother.

Infants delivered at full term have better outcomes than those born preterm. Infants born preterm are at higher risk than full term infants for neurodevelopmental, respiratory, gastrointestinal, immune system, central nervous system, hearing and vision problems. Very preterm births (before 32 weeks gestation) are at highest risk for death and life-long disability.<sup>7</sup> Children born preterm are more likely to experience learning difficulties, lower cognitive test scores and more behavioral problems later in life.<sup>8</sup>

Notably, preterm birth is the leading cause of death among newborns during the first month of life in the U.S. and in Rhode Island.<sup>9,10</sup> While survival rates of infants born prematurely have increased dramatically in recent years, preterm birth continues to be a major determinant of infant mortality and morbidity.<sup>11</sup>

## CAUSES OF PRETERM BIRTHS

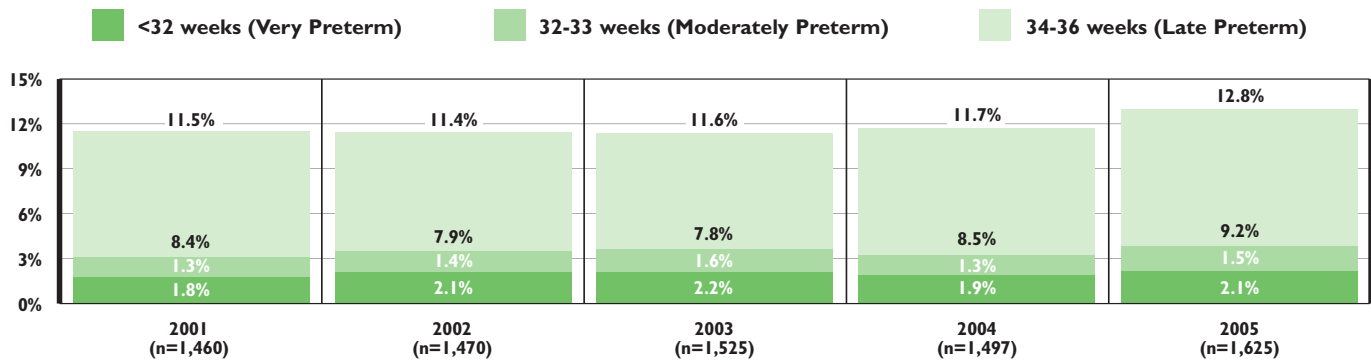
While the specific causes of spontaneous preterm births are largely unknown, research indicates that a number of inter-related risk factors are involved.

- ◆ The three leading risk factors for preterm births are (1) a history of preterm birth, (2) current multifetal pregnancy, and (3) uterine and/or cervical abnormalities.<sup>12</sup>
- ◆ Other medical risk factors include infections (particularly genito-urinary infections), diabetes, hypertension, clotting disorders, vaginal bleeding in the second trimester or in more than one trimester, fetal abnormalities, being underweight before pregnancy, obesity, and fewer than 6-9 months between one birth and the next pregnancy.<sup>13</sup>
- ◆ Multiple birth infants are more likely to be born preterm than singletons. However, singletons conceived through the use of assisted reproductive technologies have an increased risk of preterm birth than naturally conceived singletons.<sup>14</sup>
- ◆ Behavioral and environmental factors that have been associated with preterm birth include late or no prenatal care; maternal use of tobacco, alcohol, and other drugs; domestic violence, including physical, sexual or emotional abuse; lack of social support; stress; and long working hours with long periods of standing.<sup>15</sup>
- ◆ Little is known about how preterm birth can be prevented. With 1 in 8 infants being born preterm in Rhode Island and the U.S., a national research agenda targeting the prevention of preterm births must be a national priority, as advocated by the Institute of Medicine.<sup>16</sup>

## THE ROLE OF GESTATIONAL AGE – LATE PRETERM BIRTHS

- ◆ Most of the increase in preterm birth in the U.S. over the past decade was due to increases in the late preterm births (34-36 weeks gestation).<sup>17</sup> Infants born between 32-36 weeks gestation comprise the greatest number of infants born preterm in the U.S. and Rhode Island.<sup>18</sup> Very preterm births (<32 weeks gestation) comprise 2% of all births in the U.S. and Rhode Island.<sup>19,20</sup>

### PRETERM BIRTHS BY GESTATIONAL AGE, RHODE ISLAND, 2001-2005



Source: Rhode Island Department of Health, Division of Family Health, 2001-2005.

- ◆ Late preterm infants have higher risks for potentially serious health problems in comparison to those born at term, though they are usually healthier than infants born very preterm. Late preterm infants also incur greater costs, have longer lengths of stay in NICUs, and have higher rates of re-hospitalization after neonatal discharge than do infants born at term. The infant mortality rate among late preterm infants (7.7 per 1,000 live births) is three times higher than the rate among full term infants (2.5 per 1,000 live births).<sup>21</sup>



## MULTIPLE BIRTHS

- ◆ The rise in the preterm birth rate in the U.S. has been influenced by an increase in the rate of multiple births, as well as an overall increase in preterm births.<sup>22</sup>
- ◆ In Rhode Island between 2001-2005, 56.5% of multiple births were preterm, compared to 11.8% of all births and 9.9% of singleton births. Of a total of 7,581 infants born preterm between 2001-2005, 19% were multiple births.<sup>23</sup>
- ◆ The incidence of multiple births has risen in the past 20 years in the U.S. and in Rhode Island.<sup>24,25</sup> In 2004, the rate of multiple births in Rhode Island was 39.4 per 1,000 live births, compared with 29.0 in 1994.<sup>26</sup>
- ◆ Between 2002-2004 the twin birth rate was 31.6 per 1,000 births in the U.S. and 38.3 in Rhode Island. During that time period, the rate of triplets or higher was 182.8 per 1,000 births in the U.S. and 259.8 in Rhode Island.<sup>27</sup> Because 59 triplets were born in Rhode Island in 2002, compared with an average of 20 in most years, the 2002-2004 rate was unusually high. The most recent data for Rhode Island for 2004-2006 shows that the triplet birth rate was 163.9 per 1,000 births.<sup>28</sup>
- ◆ The increase in multiple births is largely attributable to the use of ART (assisted reproductive technologies including fertility drugs, in vitro fertilization (IVF) and other procedures in which the egg and sperm are handled in the laboratory), especially among women in their mid- to late 30s.<sup>29</sup>
- ◆ In 2004, the percentage of infants born in multiple birth deliveries after ART treatment in Rhode Island was 42.4% (40.2% were twins and 2.2% were triplets or higher). Rhode Island had one of the lowest rates of triplets born after ART in the U.S.<sup>30</sup> In the last 3 years, Women & Infants Hospital in Providence has developed guidelines for IVF pregnancies which have reduced the number of triplets.<sup>31</sup>



## DISPARITIES IN PRETERM BIRTH RATES

While any woman may experience a preterm birth, there are “significant, persistent and troubling racial, ethnic and socioeconomic disparities in the rates of preterm births.”<sup>32</sup>

### RACE AND ETHNICITY

- ◆ In the U.S. from 2002 to 2004, the rate of preterm births was highest for non-Hispanic Blacks (17.8%), followed by Native Americans (13.4%), Hispanics (11.8%), Whites (11.3%) and Asians (10.4%).<sup>33</sup>
- ◆ In Rhode Island between 2001-2005, 15.4% of Black infants, 14.7% of Asian infants, 14.3% of Native American infants, 13.2% of Hispanic infants and 11.2% White infants were preterm.<sup>34</sup>

### INCOME

- ◆ Women with low incomes have been shown to have higher rates of preterm births than higher-income women.<sup>35</sup>
- ◆ The rate of preterm births in the six cities in Rhode Island with the highest child poverty rates (Central Falls, Newport, Pawtucket, Providence, West Warwick and Woonsocket) from 2001-2005 was 12.9%, higher than the rate in the remainder of the state (10.8%).<sup>36</sup>

### HEALTH INSURANCE COVERAGE

- ◆ Health insurance is a major determinant in whether women have access to health care services, including

prenatal care.<sup>37</sup> Rhode Island led the nation in 2004 for the lowest percent (1.5%) of total births to mothers receiving late or no prenatal care.<sup>38</sup>

- ◆ In Rhode Island from 2001-2005, 10.9% of all births to women with health insurance were preterm, compared with 12.7% for those with public insurance and 20.9% for those with no health insurance.<sup>39</sup>

### MATERNAL SMOKING

- ◆ The rate of preterm birth for women in Rhode Island who smoke is higher than for those who do not. Between 2001 and 2005, 14.0% of all births to smokers were preterm, compared with 11.4% of all births to women who did not smoke.<sup>40</sup>

### AGE

- ◆ In the U.S. from 2002-2004, preterm birth rates were highest for women ages 40 and older (16.3%), followed by women under age 20 (14.3%), ages 30-39 (12.3%), and ages 20-29 (11.7%).<sup>41</sup>
- ◆ The rate of preterm birth among women 35 years of age or older in Rhode Island from 2001-2005 was 13.7%, while the rate was 13.1% among women under age 20. Among adolescent mothers, the preterm birth rate was 14.6% for 15-17 year olds and 12.3% for 18-19 years olds in Rhode Island between 2001 and 2005.<sup>42</sup>

## PRETERM BIRTHS, RHODE ISLAND, 2001-2005

CITY/TOWN	NUMBER OF PRETERM BIRTHS (<37 WEEKS) PER YEAR					TOTAL PRETERM BIRTHS (<37 WEEKS) 2001-2005	TOTAL LIVE BIRTHS 2001-2005	PERCENT OF PRETERM BIRTHS (<37 WEEKS) 2001-2005
	2001	2002	2003	2004	2005			
Barrington	15	10	15	10	22	72	804	9.0%
Bristol	17	16	22	15	23	93	1,033	9.0%
Burrillville	24	19	18	12	13	86	823	10.4%
Central Falls	49	39	40	47	50	225	1,989	11.3%
Charlestown	12	5	8	10	8	43	440	NA
Coventry	50	46	48	40	42	226	1,904	11.9%
Cranston	107	93	104	106	112	522	4,410	11.8%
Cumberland	37	52	42	32	51	214	1,881	11.4%
East Greenwich	11	14	12	12	6	55	551	10.0%
East Providence	48	60	63	62	67	300	2,547	11.8%
Exeter	6	8	7	8	3	32	304	NA
Foster	3	7	10	7	2	29	216	NA
Glocester	9	7	9	8	18	51	418	NA
Hopkinton	15	7	17	14	15	68	474	NA
Jamestown	1	2	1	5	4	13	218	NA
Johnston	32	30	39	30	30	161	1,440	11.2%
Lincoln	26	23	17	26	23	115	968	11.9%
Little Compton	4	7	9	6	3	29	169	NA
Middletown	18	25	24	15	16	98	1,039	9.4%
Narragansett	6	10	16	4	13	49	577	8.5%
Newport	28	22	27	44	29	150	1,558	9.6%
New Shoreham	0	0	1	1	3	5	59	NA
North Kingstown	22	33	38	28	18	139	1,450	9.6%
North Providence	23	37	43	28	52	183	1,655	11.1%
North Smithfield	10	10	7	11	11	49	496	NA
Pawtucket	127	136	134	162	136	695	5,569	12.5%
Portsmouth	10	15	12	17	19	73	898	8.1%
Providence	406	422	403	410	431	2,072	14,862	13.9%
Richmond	7	7	11	11	12	48	503	9.5%
Scituate	9	9	11	5	12	46	473	NA
Smithfield	19	10	20	11	14	74	752	9.8%
South Kingstown	21	37	22	19	32	131	1,271	10.3%
Tiverton	10	16	16	9	17	68	689	9.9%
Warren	11	13	7	9	16	56	577	9.7%
Warwick	122	78	111	91	124	526	4,414	11.9%
West Greenwich	7	5	2	4	9	27	298	NA
West Warwick	54	45	38	38	52	227	2,003	11.3%
Westerly	19	13	25	28	38	123	1,349	9.1%
Woonsocket	65	75	76	101	82	399	3,184	12.5%
<i>Unknown</i>	<i>0</i>	<i>7</i>	<i>0</i>	<i>1</i>	<i>1</i>	<i>9</i>	<i>5</i>	<i>NA</i>
<i>Core Cities</i>	<i>729</i>	<i>739</i>	<i>718</i>	<i>802</i>	<i>780</i>	<i>3,768</i>	<i>29,165</i>	<i>12.9%</i>
<i>Remainder of State</i>	<i>731</i>	<i>724</i>	<i>807</i>	<i>694</i>	<i>848</i>	<i>3,804</i>	<i>35,100</i>	<i>10.8%</i>
<i>Rhode Island</i>	<i>1,460</i>	<i>1,463</i>	<i>1,525</i>	<i>1,496</i>	<i>1,628</i>	<i>7,581</i>	<i>64,270</i>	<i>11.8%</i>

Source: Rhode Island Department of Health, Division of Family Health, Maternal and Child Health Database, 2001-2005.

Notes to Table: Core cities are Central Falls, Newport, Pawtucket, Providence, West Warwick and Woonsocket.

NA: Percentages were not calculated for cities and towns with less than 500 births, because percentages with small denominators are statistically unreliable.

Preterm births are defined as live births that occurred before 37 weeks completed gestation.

The data are reported by place of mother's residence, not place of infant's birth.

The denominator is the total number of live births to Rhode Island residents from 2001-2005.

## IMPACT OF PRETERM BIRTHS

Preterm births have implications for the infant, the mother, and their families, as well as broader societal costs. The ramifications can be seen at birth, in the first few months after birth, and for many children, throughout childhood.

◆ In 2005, the estimated annual societal economic burden associated with preterm birth in the U.S. was in excess of \$26.2 billion (\$16.9 billion for medical care services, \$5.7 billion for lost household and labor market productivity associated with disabling conditions, \$1.1 billion for special education services, and \$1.9 billion for maternal delivery costs). The cost per infant born preterm was estimated to be \$51,600.<sup>43</sup>

### IMPACTS ON FAMILIES

◆ Mothers who give birth to preterm infants report higher rates of maternal distress and maternal depressive symptoms. The family unit can be affected by the financial burden of medical costs and multiple children, limits on family social life, high levels of family stress and dysfunction, and the difficulty parents face managing employment after a preterm birth.<sup>44</sup>

### MEDICAL COSTS

◆ In 2002, half of the cost of preterm births in the U.S. was billed to employers and other private insurers. Recent research shows that costs to private employer-sponsored health insurance plans for a premature baby during the first year of life averages \$41,610, compared to \$2,830 for a full-term baby. These direct costs include hospital costs, physician visits and drugs. Additionally, in the U.S., premature babies spent an average of 16.8 days in the hospital during the 12 months following birth compared with 2.3 days for full-term babies.<sup>45</sup>

### HOSPITAL CARE

◆ Hospitalization costs for preterm infants include neonatal intensive care unit (NICU) and general hospitalization costs for the infant upon birth and the cost of additional hospitalizations during the first year of life and beyond. Infants born preterm have longer initial hospital stays after birth than full-term infants. The average initial hospital stay for newborns with no complications in the U.S. is 1.5 days, compared with 13 days for a preterm infant.<sup>46</sup>

◆ Blue Cross & Blue Shield of Rhode Island (BCBSRI) estimates that the costs of covering NICU services and complications of pregnancy comprise approximately 30% of total maternity costs. Between 2003 and 2005, full term infants covered by BCBSRI averaged 2.4 days of inpatient hospital services during the first year of life, compared with 19.5 days for babies born preterm.<sup>47</sup>

### EARLY INTERVENTION COSTS

◆ Children ages birth to 3 years who were born preterm incur higher Early Intervention (EI) costs than infants born at term. EI is a service offered by states to children from birth through age 2 who are developmentally delayed or have a diagnosed physical or mental condition that is associated with developmental delay. In a Massachusetts study, the average EI cost per infant was \$5,393 for children born between 24 and 31 weeks' gestational age, \$1,578 for infants born at 32 to 36 weeks' gestational age, and \$725 for those who were born at term.<sup>48</sup>

## CESAREAN SECTION DELIVERIES

Three-quarters of preterm births occur spontaneously. An estimated one in four preterm births is the result of medical intervention to deliver the baby early because of fetal or maternal conditions.<sup>49</sup> Nationally, there has been a shift toward earlier delivery for infants of all gestational ages.<sup>50</sup> Rising rates of planned and unplanned cesarean section deliveries and induced births have contributed to, but do not completely explain, the increases in late preterm births.<sup>51</sup> While the total rate of cesarean births in the U.S. increased for all gestational ages between 1996 (20.7%) and 2003 (27.5%), the highest increase was for full term infants and moderately preterm infants born between 32 and 36 weeks (37.3%).<sup>52</sup> Between 2001-2006, births to Rhode Island women by cesarean section increased by 29%, from 23.9% in 2001 to 30.9% in 2006.<sup>53</sup>



## CURRENT PRETERM BIRTH INITIATIVES IN RHODE ISLAND

### MARCH OF DIMES NICU PROGRAM

◆ Started in 2004, this program at Women & Infants Hospital in Providence promotes a family-centered philosophy in the neonatal intensive care unit (NICU) and provides information and support to families with sick or premature babies in the hospital, during the transition home, and in the event of a newborn death. The program's nurse-specialist complements the care of clinical staff by providing support and information to approximately 700 families per year. Components of the program include parent-to-parent support, educational materials, and services that address the challenges that NICU families may face.

### PARENT CONSULTANT PROGRAM

◆ Through the Pediatric Practice Enhancement Project (PPEP), two trained parent consultants are available at Women & Infants Hospital in Providence, one in the neonatal intensive care unit (NICU) and one in the NICU Follow-up Clinic. Parent consultants are parents and/or family members who have personal experience in the NICU and are able to provide peer support to families while they are in the NICU and as they are discharged. They provide information and community resources and connect families with other peer supports, including the Rhode Island Parent Information Network and other parent consultants in Early Intervention programs, Hasbro Children's Hospital and 20 pediatric clinical settings.

PPEP is a collaborative effort of the Rhode Island Department of Health, Rhode Island Department of Human Services, Neighborhood Health Plan of Rhode Island, and the Rhode Island Parent Information Network.

### SPECIALIZED TRANSITION CARE PROGRAM FOR HIGH RISK INFANTS

◆ Started in April 2007, the Specialized Transition Care Program at Women & Infants Hospital in Providence provides primary, preventive, therapeutic, and continuous care for very low birth weight (<1500 grams) and extremely low birth weight infants (<1000 grams) with special health care needs who are discharged from the neonatal intensive care unit (NICU). Families in the program receive a home visit before their infant is discharged from the hospital, in order to identify needs and to introduce the care plan. The family also receives between one and five specialized post-discharge home visits by an experienced NICU nurse practitioner to provide assessment and support in parenting and care skills to implement the care plan. The program also initiates post-discharge coordinated multidisciplinary specialized services within 2-3 weeks of discharge, including Early Intervention and specialty services. The program aims to provide coordinated multidisciplinary specialized services at the Follow-up Clinic, which is linked to the family's medical home in the community. This program aims to serve 120 families per year.

### FEDERAL LEGISLATION AIMED AT REDUCING PRETERM BIRTHS

◆ After an effort spearheaded by the March of Dimes Foundation, the PREEMIE (Prematurity Research Expansion and Education for Mothers who deliver Infants Early) Act was passed into law in December 2006, authorizing \$19 million for 2007 and \$18 million a year for 2008 through 2011. The purpose of the Act is to reduce rates of preterm labor and delivery; work towards an evidence-based standard of care for pregnant women at risk of preterm labor or other serious complications, as well as for infants born preterm and at a low birth weight; and reduce infant mortality and disabilities caused by prematurity. The Act provides funding for expanded research on prematurity, public health and professional education, and health services related to prematurity. The Centers for Disease Control and Prevention (CDC) will expand and coordinate activities on preterm labor and delivery and infant mortality, conduct research on the relationship between prematurity, birth defects, and developmental disabilities, and establish systems to link information with the Pregnancy Risk Assessment Monitoring System (PRAMS).<sup>54</sup>

## RHODE ISLAND TASKFORCE ON PREMATURE BIRTHS

◆ In 2006, the Rhode Island Department of Health, in collaboration with the March of Dimes and Women & Infants Hospital, convened a taskforce of stakeholders to develop actionable recommendations to improve the health of babies in Rhode Island by decreasing the rate of preterm births and decreasing morbidity and mortality associated with preterm births. Following presentations by national and state experts, the taskforce explored four specific areas that impact preterm birth rates: women who have had a previous preterm birth, smoking and/or substance abusing pregnant women, pregnant adolescents, and women at risk for unintended pregnancies. Taskforce members voted on recommendations they felt would have the greatest impact on reducing preterm birth in Rhode Island. After releasing its top 10 recommendations at the March of Dimes Prematurity Summit in November 2006, the Taskforce continues to meet to identify actions that can be taken to reduce preterm births in Rhode Island. The Chair of the Taskforce is Dr. Maureen Phipps at Women & Infants Hospital (401-274-1122 x2834).

### RECOMMENDATIONS

The Rhode Island Taskforce on Premature Births issued 10 Key Recommendations in November 2006. Rhode Island KIDS COUNT endorses the Taskforce's recommendations below, which were determined through the input of a large group of stakeholders.<sup>55</sup>

1. Encourage providers to assess the risk for preterm birth with each pregnant woman during prenatal care, including a history of preterm birth. If a previous preterm birth is documented, the provider should recommend administering 17-hydroxyprogesterone (17-P). 17-P begun early in the second trimester and continued weekly until 36 weeks has been effective in preventing preterm births among women with a history of previous preterm births.<sup>56,57</sup> Develop and implement an educational campaign for providers and patients addressing: (1) who is eligible, when to administer, and how to order 17-P and (2) identifying women who have had a previous preterm birth during prenatal care.
2. Support a family planning waiver based on income to cover family planning services for women who would be covered by Medicaid if they became pregnant.
3. Develop a coordinated medical home for preterm infants by bringing together payors, providers, and the Health Department.
4. Enforce the implementation by all school districts of the Rhode Island Department of Education's standards for comprehensive sex education.
5. Implement changes to the birth certificate. Items to be added include: (1) identifying the methodology used to calculate gestational age and (2) determining whether fertility treatment was used to achieve pregnancy and what type.
6. Enhance comprehensive, relationship-based family support programs, such as Early Head Start and Nurse Family Partnership, to improve outcomes for teens and their children and prevent subsequent teen pregnancy.
7. Expand the range of services provided at Title X sites to include women's health services before and between pregnancies.
8. Develop a policy whereby every vendor that sells tobacco and alcohol in Rhode Island must display information about the effects of tobacco and alcohol on pregnancy outcomes.
9. Ensure that adequate programs and referral networks exist for pregnant women who smoke and for substance abusing pregnant women including: (1) treatment programs where women are not separated from their children during treatment, (2) home visiting programs, and (3) establishing preferred prenatal provider networks.
10. Expand and assure access to emergency contraception for low-income women. Ensure information as well as immediate and advanced access for teens and adult women as a standard of care through RIte Care/RIte Share.

## RHODE ISLAND RESOURCES

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