My Childhood, My Future

Early Childhood Development in Jordan

WORLD BANK GROUP

CHAPTER 8

Jordan

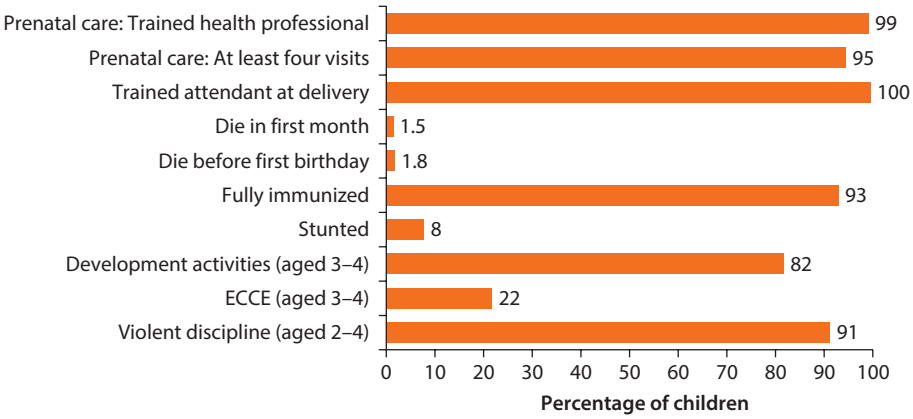
The State of Early Childhood Development in Jordan

Jordan is one of the Middle East and North Africa (MENA) countries with some notable successes in early childhood development (ECD), but areas for improvement remain. Figure 8.1 shows summary indicators of early childhood development in Jordan. In terms of prenatal and delivery care, Jordan is doing well; 99 percent of births received prenatal care, 95 percent received regular prenatal care (at least four visits) and 99 percent had a skilled attendant at delivery. In the first month of life, 1.5 percent of children die, and in the first year of life, 1.8 percent of children die. Jordan has good immunization coverage, with 93 percent of children age 1 fully immunized. Malnutrition is a moderate problem in Jordan, with 8 percent of children stunted. There are some deficits in terms of children's social and emotional development: 82 percent of children have experienced development activities, only 22 percent of three- to four-year-olds are attending early childhood care and education (ECCE), and violent child discipline is nearly universal (91 percent of children).

This chapter presents the status of early childhood development in Jordan. The health status of children is examined through indicators (see box 8.1) of early mortality, prenatal care, having a skilled attendant at birth, and immunizations. Children's nutritional status is measured by stunting (height-for-age). To assess cognitive and social or emotional development, the analysis looks at the extent to which children are engaged in developmental learning activities, attendance in ECCE, and whether children are violently disciplined.

To better understand the context and conditions that influence ECD outcomes, the analysis also examines background factors that may be associated with ECD outcomes at the individual, household, and community levels and their relationships (see annexes 8A, 8B, and 8C for additional information on the data and these relationships). For the overall country context, see box 8.2. Finally, the analysis measures the gaps and extent of inequality in ECD outcomes. The analysis is based on the latest available data: the Demographic and Health Survey (DHS) from 2012. The data cover the various dimensions of early childhood from before a child is born until the age of school entry (six years in Jordan).

Figure 8.1 ECD Summary Indicators



Source: World Bank calculations based on Jordan Demographic and Health Survey (DHS) 2012.
Note: ECCE = early childhood care and education; ECD = early childhood development.

Box 8.1 ECD Indicators Examined in Jordan

Prenatal care
Skilled attendant at delivery
Neonatal mortality (dying in the first month)
Infant mortality (dying in the first year)
Fully immunized
Stunting/Height-for-age
Parental development activities
ECCE
Violent discipline

If more indicators were available and examined, they could provide an even richer picture of ECD in Jordan. While under normal circumstances ECD indicators change relatively slowly, on the ground today, in light of the conflicts in neighboring countries and the large number of refugees in Jordan, there may have been more rapid and substantial changes, providing both new challenges and new opportunities to improve ECD in Jordan.

Survival, Health Care, and Nutrition

The first step in healthy early childhood development is simply surviving early childhood. Infant mortality, which refers to children dying before their first birthday, is 18 deaths per thousand births in Jordan.[1] This is below the average rate for the MENA region (24 per thousand) (UNICEF 2014). Most of infant mortality is composed of neonatal mortality—children dying within the first month of life. In Jordan, 15 children out of every thousand die during their first

Box 8.2 Summary of Development Indicators in Jordan

Jordan is an upper-middle-income country with a gross domestic product per capita in 2012 of about $4,909 (in current US Dollars, table B8.2.1). Jordan has an estimated population of 6 million, of which a third are under the age of 15. The average life expectancy at birth is 74 years, which compares well with other countries at this level of development. The primary gross enrollment rate in Jordan was 98 percent in 2012. Overall, Jordan ranks 100 out of 186 countries with comparable data in the 2012 Human Development Index.

Table B8.2.1 Jordan's Socioeconomic Indicators

	1990	*2012*
Total population (millions)	3.2	6.3
% of population under 15	46	34
GDP per capita (current US dollars)	$1,312	$4,909
Life expectancy at birth (years)	70	74
School enrollment, primary (% gross)	102	98

Sources: UNDP 2014; World Development Indicators.
Note: Primary gross enrollment rate for 2012 is 2011 data; GDP = gross domestic product.

month of life, which is the same as the regional average (UNICEF 2014). Reducing under-five mortality rates by two-thirds is one of the Millennium Development Goals. Although infant and under-five mortality are below regional averages, they have shown no improvement over the past decade. Rates of infant and under-five mortality in the five years preceding the 2012 DHS survey are essentially identical to those in the five to nine years prior to the survey (Department of Statistics (Jordan) and ICF International 2013).

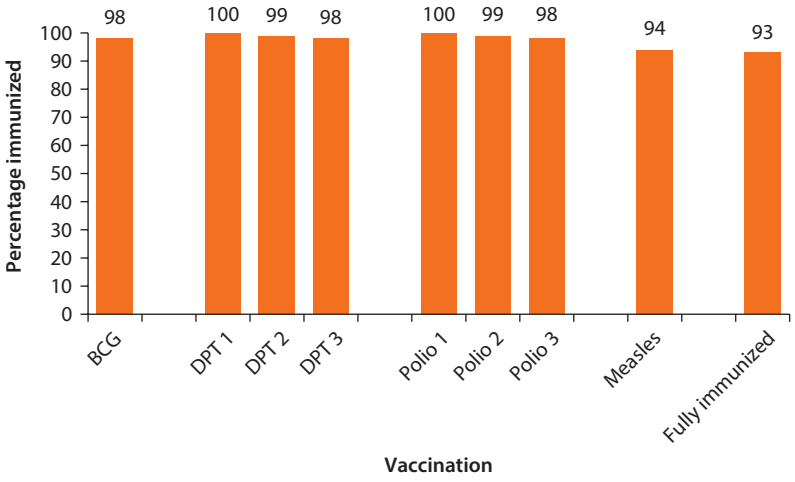
Addressing both early mortality and early childhood development begins during pregnancy and delivery. In Jordan, almost all births[2] (99 percent) received prenatal care and were attended by a skilled health professional.[3] Most (95 percent) of those who received prenatal care did so "regularly," with four or more visits. Jordan has had high prenatal care coverage throughout the 2000s and much of the 1990s; the rate was also 99 percent in 2002, 96 percent in 1997, and 80 percent in 1990 (World Development Indicators). The current rate is well above the MENA region average of 83 percent (UNICEF 2014). As with prenatal care, rates of skilled delivery attendants have been high throughout the 1990s and 2000s (World Development Indicators).

The immunization of children plays an important role in preventing illnesses and reducing child mortality (Molina 2012). Jordan has good immunization coverage, with 93 percent of children ages 12–23 months fully immunized. Children are considered fully immunized if they have received immunizations for all six major preventable childhood diseases: tuberculosis, diphtheria, whooping cough, tetanus,[4] polio,[5] and measles. They should be fully immunized by 12 months of age; this analysis focuses on children 12–23 months to allow for optimal

parental recall. The measles vaccine is a definitive weakness of Jordan's immunization campaigns (figure 8.2); only 94 percent of 12–23-month-olds have received it. Jordan does a very good job of ensuring that children receive the third of three doses, which is a weakness in other countries. Ninety-eight percent of children 12–23 months had received the third DPT (diphtheria, pertussis, tetanus) dose, and 98 percent of children 12–23 months had received the third polio dose.

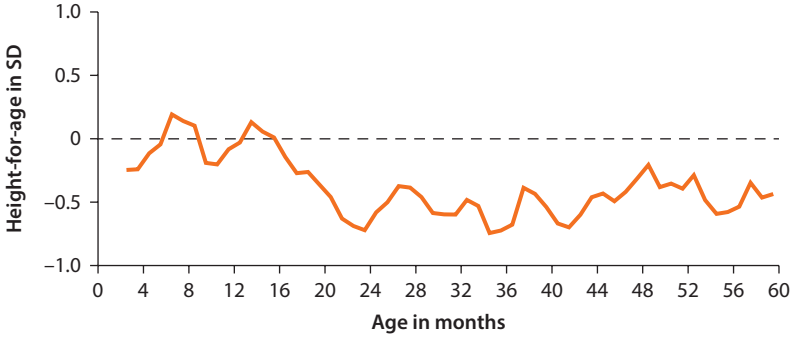
Children in Jordan start their lives on fairly healthy footing, in terms of nutrition; however, after the first year of life, they experience a slight falling off from healthy growth. In Jordan, 8 percent of children age zero to four are stunted. Figure 8.3 shows how Jordanian children fare compared to a healthy reference population.[6] During their first year of life, Jordanian children tend to have similar

Figure 8.2 Percentage of Children Aged 12–23 Months Immunized, by Vaccination



Source: World Bank calculations based on Jordan DHS 2012.
Note: BCG = Bacillus Calmette–Guérin (tuberculosis vaccine); DPT = diphtheria, pertussis, tetanus.

Figure 8.3 Average Height-for-Age Compared to Healthy Reference Population, in Standard Deviations, by Age in Months, 3 Month Moving Average



Source: World Bank calculations based on Jordan DHS 2012.

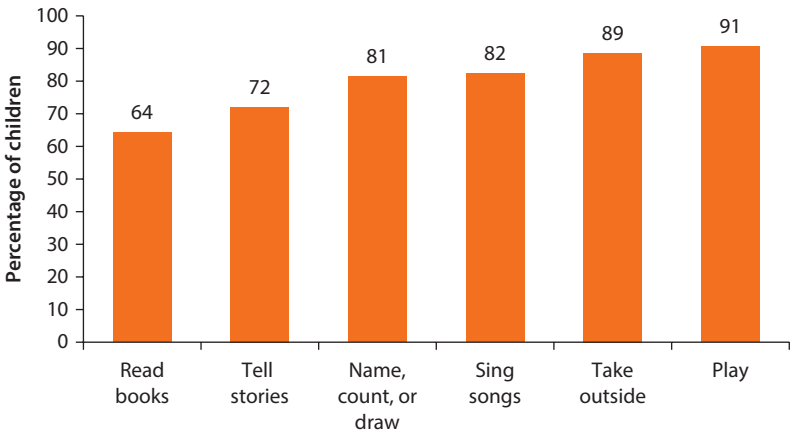
height-for-age to the healthy reference population. However, during the second year of life there is a general falling off; children fluctuate around half a standard deviation below the average, up through age five.

Cognitive, Social, and Emotional Development

Although it has been proven that play and interaction are important components of early childhood development, children in Jordan are missing out on important opportunities for psychosocial growth. In the survey, caretakers of children ages three and four were asked whether adults in the household had engaged in any of six different activities that support child development.[7] In Jordan, the majority of children (82 percent) experienced at least four development activities. However, a fifth (18 percent) experienced fewer than four activities. While all the activities are important to social and emotional development, reading and naming, counting, and drawing have an important educational and cognitive component. However, as activities, being taken outside and playing were most commonly observed (figure 8.4), with around 90 percent of children having experienced each of these activities. The least frequently observed activity was reading books, with only 64 percent of children having books (or picture books) read to them.

Evidence has shown that ECCE improves cognition and socioemotional development, with benefits that can last a lifetime. Early childhood education and early learning play an important role in school success. In Jordan, just 22 percent of children aged three and four attend an early childhood care or education program; that means more than three-quarters (78 percent) of three- to four-year-old children are missing out on this important opportunity to develop and prepare for school.

Figure 8.4 Percentage of Children Experiencing Different Development Activities, Ages 3–4



Source: World Bank Calculations based on Jordan DHS 2012.

Another challenge that risks hindering the healthy development of children in Jordan is violent discipline.[8] Violent child discipline is common in Jordan, with 91 percent of children ages two to four having experienced violent child discipline in some form. Disciplining children is an important part of child rearing. However, research has found that violent discipline negatively impacts the physical, psychological, and social development of children (UNICEF 2010).

Key Factors Affecting Early Childhood Development

A number of background characteristics at the child, family, and community levels affect ECD outcomes: gender, parents' education, household socioeconomic status (wealth),[9] geographic location (region or governorate), and residence (urban/rural). Understanding these relationships can help identify why some children have poor ECD outcomes and which children to target with policy or programmatic interventions.

Survival, Health Care, and Nutrition

Background characteristics have a complex relationship with infant mortality in Jordan. The wealth of a child's household is strongly associated with a child's survival chances. Children in the poorest 20 percent of households are more than twice as likely to die before their first birthday as children in the richest 20 percent of households. However, children with mothers with no education have approximately the same odds of dying before their first birthday as children with mothers who have an incomplete or complete secondary education. Several governorates have infant mortality rates above 20 per thousand, including Madaba, Mafraq, Karak and Ma'an.

Use of prenatal care and deliveries attended by skilled professionals are nearly universal; there are only small differences by background. The largest differences in prenatal care use are associated with education. While almost 100 percent of women with higher education use prenatal care, only 85 percent of women with no education use prenatal care. Use of prenatal care shows small differences by wealth, with 97 percent of births in the poorest fifth of households receiving prenatal care, compared to almost 100 percent in the richest fifth of households. After taking into account other characteristics, births in the second wealth level are significantly[10] more likely to receive prenatal care than births in the poorest 20 percent of households. Mothers with complete secondary and fathers with higher education are significantly more likely to use prenatal care.

Although prenatal care rates are high and there are only small differences by background, regular prenatal care shows stronger gradients by background; while 88 percent of births to women in the poorest quintile receive regular prenatal care, 99 percent of the richest receive regular prenatal care. Similar differences are seen by education, but there are only small urban/rural or regional differences. In observing rates based on wealth, the differences in having skilled birth attendants are similar to those for prenatal care—after accounting for other characteristics, both the second and middle wealth quintile have significantly higher

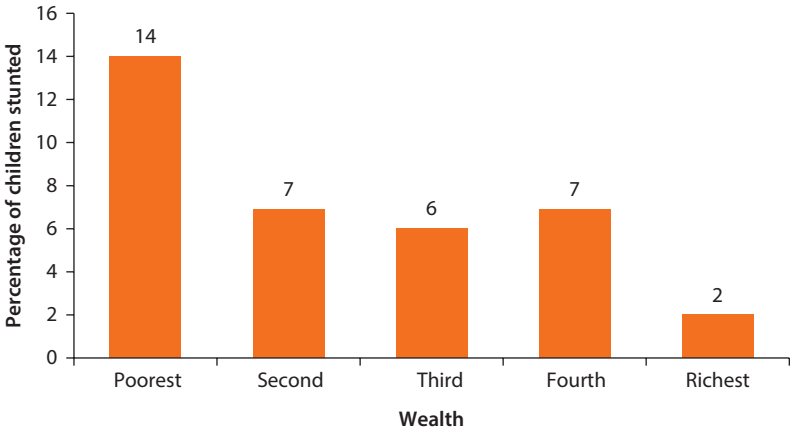
rates than the poorest quintile, and births to fathers with incomplete secondary have a higher chance than those with no education as well.

Some sub-populations fall below the level of full immunization that confers herd immunity.[11] There are also some differences in immunization rates based on wealth, with 89 percent of children 12–23 months fully immunized in the poorest fifth of households, a high of 97 percent in the middle wealth level, and 91 percent immunized in the richest wealth level. Only 70 percent of children 12–23 months with uneducated mothers are fully immunized, compared to 80–87 percent of children of mothers with incomplete or complete primary education and 94–98 percent of children of mothers with incomplete secondary education through higher education.

Immunization campaigns are warranted in governorates with rates of immunization below 90 percent; Tafiela and Ma'an have full immunization rates below 90 percent for 12–23-month-olds. Taking into consideration other characteristics, children in the middle wealth level are more likely to be immunized than the poorest. Children with more educated mothers and fathers are more likely to be immunized.

In Jordan, stunting and height-for-age are closely related to children's background characteristics. The rates of stunting are strongly associated with gender, wealth, mother's education, residence, and region. Male children are more likely to be stunted (9 percent) than female children (6 percent). While a child from the poorest fifth of households has a 14 percent chance of being stunted, a child from the wealthiest fifth of households has a 2 percent chance. Even the difference between the third and fourth wealth levels (6–7 percent stunted) and the richest 20 percent of households (2 percent stunted) is quite dramatic (figure 8.5). While a child with an uneducated mother has almost a 12 percent chance of being stunted, a child with a mother with higher education has only a 5 percent chance of being stunted. Rural children (9 percent) are more

Figure 8.5 Percentage of Children Aged 0–4 Stunted, by Wealth



Source: World Bank calculations based on Jordan DHS 2012.

likely to be stunted than urban children (7 percent), and children in the South are more likely to be stunted (12 percent) than children in the Central (8 percent) or North (7 percent) regions. A number of governorates have stunting rates above 10 percent, including Mafraq, Karak, Ma'an, and Aqaba.

Taking into consideration other characteristics, children in the South are significantly more likely to be stunted compared to those in the Central region. Wealthier children have significantly lower rates of stunting than children from the poorest 20 percent of households. There are no significant differences by mother's and father's education. Female children are significantly less likely to be stunted than male children.

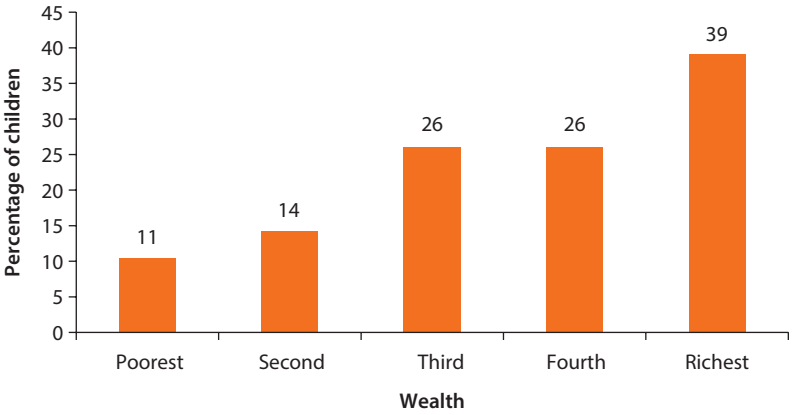
Social, Emotional, and Cognitive Development

Social, emotional, and cognitive development are also strongly associated with the wealth level of the child's household and the location of the household. Poorer children are less likely to experience four development activities than richer children. For instance, while children from the poorest fifth of households have a 75 percent chance of experiencing four or more development activities, children from the richest fifth of households have a 87 percent chance. The chances of development activities also increase with parents' education. While a child whose mother has no education has only a 58 percent chance of development activities, a child whose mother has secondary or higher education has an 86–87 percent chance. Children growing up in rural areas have a slightly lower chance of development activities (78 percent) than children living in urban areas (82 percent). Taking into account other characteristics, children in the South are significantly more likely to experience development activities than children in the Central region, and children with more educated mothers and fathers are significantly more likely to experience development activities.

Only 11 percent of children three to four years old are attending some form of ECCE among the poorest fifth of households, while 39 percent attend among the richest fifth of households (figure 8.6). The greatest benefits from ECCE are likely to be for the poorest and most vulnerable children, yet they have the least access. ECCE access also increases with parents' education. There are geographic differences in attending ECCE. Rural areas have lower attendance (19 percent) than urban areas (22 percent), and the Central region has lower attendance (20 percent) than the North (26 percent) or South (24 percent) regions. After accounting for other characteristics, children in the North and South are significantly more likely to attend ECCE than children in the Central region. ECCE attendance increases with wealth, and also if a mother has a higher education.

Other aspects of children's social and emotional development such as violent child discipline also vary by wealth level and parents' education. Violent child discipline is lower for children in the richest households (76 percent) than the poorest households (96 percent). Rates of violent discipline are lower with more educated parents, especially parents with higher education. After taking into account other characteristics, being in

Figure 8.6 Percentage of Children Aged 3–4 Years Attending ECCE, by Wealth



Source: World Bank calculations based on Jordan DHS 2012.
Note: ECCE = early childhood care and education.

the North as compared to Central region increases the chances of violent discipline, while being from the richest fifth of households significantly decreases the chance of violent discipline.

Children Face Unequal Opportunities for Healthy Development

Children in Jordan often face different opportunities for healthy development based on factors beyond their control. To measure the extent of inequality, the analysis calculates (a) the percentage of opportunities that needed to have been distributed differently for equality of opportunity to have occurred for each of the ECD indicators, and (b) the chance of whether these differences might have occurred by random variation (table 8.1). For prenatal care, skilled delivery, and being fully immunized, there is little inequality. There are equal opportunities for children to access early health services, regardless of their circumstances. While there are unequal chances to die early in life, since this is a rare occurrence, we cannot definitively say whether or not these differences are due to chance. Children face unequal opportunities for healthy physical growth, in terms of stunting. Children face relatively equal chances of development activities and violent child discipline. There is substantial inequality in terms of ECCE; 24.4 percent of chances to attend ECCE would need to have been distributed differently for children to have equality of opportunity.

Wealth, parents' education, and geographic differences make the largest contributions to children's unequal chances. Table 8.2 shows the different contributions of circumstances to inequality for different outcomes as percentages. Wealth plays a particularly large role in all the outcomes. Mother's education is important for a variety of outcomes, and tends to be more important than father's education, although father's education plays a small but important role

Table 8.1 Percentage of Opportunities to Be Redistributed

	Dissimilarity index
Prenatal care	0.5
Skilled delivery	0.2
Neonatal mortality	19.7
Infant mortality	20.3
Fully immunized	2.3
Stunted	24.1*
Development activities	3.4
ECCE	24.4***
Violent discipline	4.5

Source: World Bank calculations based on Jordan DHS 2012.
Note: Significance level: * = chance < 5%, ** = chance < 1%, *** = chance < 0.1%; ECCE = early childhood care and education.

Table 8.2 Contributions of Background Characteristics to Inequality
Percentage

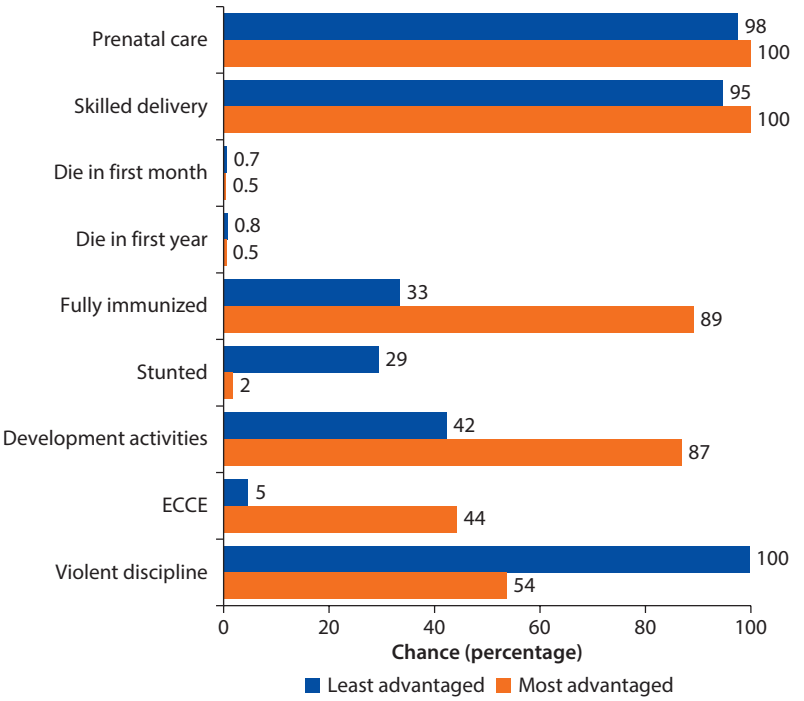
	Wealth	*Mother's education*	*Father's education*	*Region*	*Rural*	*Child's sex*	*Distance problem*
Prenatal care	45.6	23.6	22.0	0.6	2.2	n.a.	5.9
Skilled delivery	46.7	21.8	27.1	1.9	0.6	n.a.	2.0
Fully immunized	28.5	29.7	9.7	17.1	2.4	1.1	11.6
Neonatal mortality	41.5	15.5	20.0	0.4	0.7	21.1	0.8
Infant mortality	31.2	20.3	32.2	1.6	0.7	12.3	1.7
Stunted	28.9	24.3	13.1	17.7	2.0	13.2	0.8
Development activities	22.9	37.5	22.2	13.0	3.6	0.8	n.a.
ECCE	38.2	39.6	14.5	7.3	0.4	0.0	n.a.
Violent discipline	25.0	13.2	26.8	11.9	18.6	4.5	n.a.

Source: World Bank calculations based on Jordan DHS 2012.
Note: Shapley decompositions of the dissimilarity index. ECCE = early childhood care and education; n.a. = not applicable or not available.

in inequality for these outcomes as well. Regional differences are relatively small, and there are few urban/rural differences. A child's sex contributes very little to inequality except for early mortality. Distance to health care contributes very little to inequality of opportunity.

Children tend to be consistently advantaged or disadvantaged across a variety of different dimensions of ECD, and can face very different life chances based on just a few characteristics. Early childhood is when cycles of poverty and inequality are transmitted across generations. If we observe a child who lives in the rural South, in the poorest 20 percent of households, with uneducated parents (a least advantaged child) and compare that child to one that has parents with higher education, from the richest 20 percent of households, who lives in an urban part of the Central region (a most advantaged child), we find that they have very different chances of early childhood development. Figure 8.7 presents the chance

Figure 8.7 Most Advantaged and Least Advantaged Simulations



Source: World Bank calculations based on Jordan DHS 2012.
Note: ECCE = early childhood care and education.

of different ECD indicators, based on the regressions, for a "least advantaged" and "most advantaged" individual.

On every single indicator, the least advantaged child faces a poorer chance for early development. Gaps in prenatal and delivery care are relatively small, with the most advantaged child 2 percentage points more likely to get prenatal care (98 percent vs. 100 percent), and 5 percentage points more likely to get delivery care (95 percent vs. 100 percent). There are only small gaps in early mortality but large gaps in being fully immunized, with the most advantaged child having an 89 percent chance of being immunized but a least advantaged child having only a 33 percent chance. The least advantaged child is 29 percentage points and 17 times more likely to be stunted. Additionally, the least advantaged child is 45 percentage points less likely to experience development activities. While the most advantaged child has a 44 percent chance of attending ECCE, the least advantaged child has only a 5 percent chance. The least advantaged child is almost certain to be violently disciplined, compared to a 54 percent chance for the most advantaged child. Across every dimension of health, social, emotional, and cognitive development, the least advantaged and most advantaged children face very different chances of development.

Conclusions

Jordan does well on early health, but malnutrition is still a problem for some children. A number of children are missing out on development activities, and only a minority attend ECCE. Violent child discipline is a pervasive problem in Jordan. There is substantial inequality in malnutrition, and children have very unequal chances to attend ECCE. Where children are born, the wealth of their families, and their parents' education all contribute substantially to unequal chances for healthy ECD. More needs to be done to ensure that children thrive in their early years and have equal chances to grow and develop. Additionally, children in Jordan are facing substantial challenges due to the conflicts in neighboring countries and the influx of refugees. The additional strain of refugees on Jordan's resources, and especially on its health and education systems, will present substantial challenges for Jordan going forward.

Annex 8A: The Data

The Data Sets

The analysis utilizes cross-sectional data on the well-being of women and children collected in the Demographic and Health Survey (DHS) for 2012 in Jordan. The DHS in Jordan is administered as the Jordan Population and Family Healthy Survey (JPFHS). The surveys are nationally representative and include data that allow for an analysis of the relationship between early childhood development and child and household indicators. See Department of Statistics (Jordan) and ICF International (2013) for additional information in the final report on the 2012 survey.

The Sample

The 2012 DHS for Jordan sampled 15,190 households, 11,352 ever-married women ages 15–49, and 6,368 children younger than age five (anthropometric measures). The analysis in this note is weighted in order to be representative at the national level. The sample sizes reported (N) in each of the tables are based on the unweighted number of observations in the data.

Annex 8B: Indicators by Background Characteristics

Table 8B.1 Indicators by Background Characteristics

	Prenatal care	*Prenatal care: four visits*	*Skilled attendant at birth*	*Died in first month*	*Died before first birthday*	*Fully immunized (age 1)*	*Stunted*	*Height-for-age, SD away from normal healthy*	*Development activities*	*ECCE*	*Violent discipline*	*Percent of children (0–4)*
Gender												
Male				1.4	1.8	92.7	9.1	–0.40	80.5	20.9	91.8	52.1
Female				1.5	1.9	93.3	6.1	–0.39	82.8	22.6	91.1	47.9
Wealth quintile												
Poorest	97.4	88.3	98.9	2.2	2.9	89.3	13.9	–0.76	74.6	10.5	95.7	23.1
Second	99.5	94.1	100.0	1.2	1.6	93.7	6.9	–0.42	80.8	14.3	92.3	22.2
Third	99.6	95.1	100.0	1.2	1.6	97.1	6.2	–0.38	82.7	25.8	94.0	21.5
Fourth	99.4	97.5	99.5	1.3	1.5	94.3	6.7	–0.22	86.3	26.4	92.9	19.4
Richest	100.0	98.7	100.0	1.2	1.2	91.1	1.8	0.03	86.5	39.1	76.2	13.8
Mother's education												
No education	98.0	84.7	98.1	0.9	0.9	69.5	11.8	–0.97	57.5	7.6	94.7	2.1
Incomplete primary	95.6	85.7	99.4	1.5	2.1	86.8	14.4	–0.98	73.1	13.0	96.1	3.1
Complete primary	96.5	88.5	99.7	2.0	2.1	79.9	10.1	–0.43	63.7	4.7	100.0	3.2
Incomplete secondary	98.9	93.2	99.6	1.8	2.4	93.6	9.5	–0.53	80.6	15.4	93.4	45.1
Complete secondary	99.9	97.4	99.3	1.9	2.1	97.9	5.6	–0.20	86.0	24.4	88.4	14.8
Higher education	99.7	97.0	99.9	0.7	0.9	93.5	4.6	–0.17	86.5	34.6	88.9	31.7
Father's education												
No education	96.5	82.7	96.9	1.2	1.5	57.4	19.0	–1.00	46.8	7.9	97.7	1.0
Incomplete primary	96.7	86.5	99.4	1.4	2.5	95.4	10.6	–0.74	68.5	12.0	81.0	6.3
Complete primary	98.7	88.9	99.7	1.9	2.0	92.3	7.2	–0.53	77.3	5.3	87.1	4.8
Incomplete secondary	98.9	94.8	99.8	1.6	2.0	93.8	8.7	–0.49	81.4	18.9	95.4	48.8

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Table 8B.1 Indicators by Background Characteristics *(continued)*

	Prenatal care	*Prenatal care: four visits*	*Skilled attendant at birth*	*Died in first month*	*Died before first birthday*	*Fully immunized (age 1)*	*Stunted*	*Height-for-age, SD away from normal healthy*	*Development activities*	*ECCE*	*Violent discipline*	*Percent of children (0–4)*
Complete secondary	99.6	94.7	99.3	1.5	2.3	97.6	7.0	–0.24	83.9	20.9	93.7	14.1
Higher education	100.0	97.0	99.6	1.1	1.2	90.7	4.7	–0.13	86.6	34.2	84.7	25.0
Residence												
Urban	99.1	94.7	99.6	1.5	1.8	93.0	7.4	–0.36	82.4	22.3	91.0	81.5
Rural	99.2	93.5	99.7	1.5	2.0	92.8	9.0	–0.51	78.0	19.3	93.8	18.5
Region												
Central	99.1	94.3	99.6	1.3	1.7	93.0	7.5	–0.37	81.5	19.5	89.1	61.2
North	99.2	95.3	99.7	1.7	2.1	94.5	6.6	–0.37	80.3	25.9	96.0	29.2
South	99.1	93.5	99.5	1.6	2.2	88.6	12.2	–0.57	86.2	24.1	93.0	9.6
Governorate												
Amman	98.8	93.6	99.4	1.3	1.7	91.5	7.2	–0.32	83.6	20.5	86.4	36.8
Balqa	99.6	95.9	99.8	1.3	1.8	94.8	5.5	–0.39	72.1	19.1	93.1	7.2
Zarqa	99.5	94.9	100.0	1.2	1.4	96.3	9.7	–0.53	80.1	17.3	93.0	14.4
Madaba	99.2	96.2	99.5	2.6	3.0	91.6	4.3	–0.22	85.9	19.0	97.8	2.8
Irbid	99.1	96.4	99.8	1.7	1.9	95.6	5.0	–0.23	80.0	29.1	96.2	17.6
Mafraq	99.3	91.7	99.3	2.2	2.8	90.0	10.4	–0.71	78.7	17.3	94.7	5.8
Jarash	99.2	95.3	99.9	1.8	1.9	96.3	9.0	–0.53	81.5	26.5	96.7	3.4
Aljun	99.6	95.4	100.0	0.8	1.3	94.6	4.7	–0.38	85.5	22.6	96.1	2.4
Karak	99.3	93.9	99.5	2.0	2.4	90.4	11.2	–0.54	86.3	26.1	94.5	4.1
Tafiela	99.3	94.8	99.3	1.0	1.6	88.0	9.9	–0.43	85.3	22.4	94.3	1.6
Ma'an	97.5	87.9	98.9	1.2	2.3	78.8	18.6	–0.86	84.0	26.0	93.6	1.7
Aqaba	99.9	95.9	100.0	1.5	1.9	93.7	10.4	–0.50	88.5	19.6	89.3	2.2
Total	99.1	94.5	99.6	1.5	1.8	93.0	7.6	–0.39	81.6	21.7	91.3	100.0
N (observations)	6,811	6,810	10,360	8,462	8,462	2,030	6,267	6,267	3,904	3,826	1,654	10,128

Source: World Bank calculations based on Jordan DHS 2012.
Note: Blank cells indicate not applicable or not available. ECCE = early childhood care and education; SD = standard deviation.

Annex 8C: Relationship between ECD Indicators and Background, When Accounting for Multiple Characteristics

Table 8C.1 Relationship between ECD Indicators and Multiple Background Characteristics

	Prenatal	*Delivery*	*Neonatal mortality*	*Infant mortality*	*Fully immunized*	*Stunted*	*Height-for-age*	*Development indicators*	*ECCE*	*Violent discipline*
Rural										
Region—compared to central										
North									+	+
South						+		+	+	
Wealth—20% of households—compared to poorest										
Second	+	+		−		−	+			
Middle		+			+	−	+		+	
Fourth						−	+		+	
Richest						−	+		+	−
Mother's education—compared to no education										
Incomplete primary										
Complete primary							+			
Incomplete secondary				+	+			+		
Complete secondary	+				+		+	+		
Higher education					+		+	+	+	
Father's education—compared to no education										
Incomplete primary					+					
Complete primary					+			+		
Incomplete secondary		+			+			+		
Complete secondary					+			+		
Higher education	+							+		

table continues next page

Table 8C.1 Relationship between ECD Indicators and Multiple Background Characteristics *(continued)*

	Prenatal	*Delivery*	*Neonatal mortality*	*Infant mortality*	*Fully immunized*	*Stunted*	*Height-for-age*	*Development indicators*	*ECCE*	*Violent discipline*
Distance problem								n.a.	n.a.	n.a.
Female						–				
Model significance	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005
N (observations)	6,248	9,584	8,462	8,462	2,030	6,267	6,267	3,827	3,826	1,605
R-squared							0.063			
Pseudo R-squared	0.126	0.160	0.026	0.027	0.103	0.058		0.040	0.094	0.126

Source: World Bank calculations based on Jordan DHS 2012.
Note: Blank cells indicate no statistically significant relationship. + = chance < 5% and positive, – = chance < 5% and negative; ECCE = early childhood care and education; ECD = early childhood development; n.a. = not applicable.

Notes

1. Both infant and neonatal mortality rates are calculated based on deaths in the 12–59 months preceding the DHS survey.
2. The Jordan 2012 DHS asks about prenatal care for the most recent live birth and about delivery care for all births in the past five years (since 2007).
3. Either a doctor or a nurse.
4. The DPT vaccine is a combination vaccine that covers diphtheria, whooping cough (pertussis), and tetanus. Children must receive three doses to be fully immunized.
5. Children must receive three doses to be fully immunized against polio.
6. The units show how Jordanian children are, on average, different from the reference population in terms of standard deviations.
7. The six activities are: (1) read books or look at picture books with the child; (2) tell stories to the child; (3) sing songs with the child; (4) take the child outside the home, compound, yard, or enclosure; (5) play with the child; and (6) spend time with the child naming, counting, and/or drawing things.
8. Per the MICS definitions, violent child discipline is based on discipline by anyone in the household within the last month, and includes psychological aggression (shouted, yelled, or screamed at the child; called the child dumb, lazy, or another name like that); physical punishment (shook the child; spanked, hit or slapped the child on the bottom with a bare hand; hit the child on the bottom or elsewhere on the body with something like a belt, hairbrush, stick, or other hard object; hit or slapped the child on the hand, arm, or leg); and severe physical punishment (hit or slapped the child on the face, head, or ears; beat the child with an implement (hit over and over as hard as one could).
9. Wealth is defined in terms of which 20 percent of households a child falls into, based on an asset (wealth) index of durable goods.
10. Throughout, we use a 5 percent level of significance.
11. Herd immunity occurs when even unvaccinated individuals in the population (the "herd") are protected against illness because the disease can no longer spread. This is achieved once around 90–95 percent of infants are vaccinated.

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