

## Prevalence and psychosocial correlates of global developmental delay in 3-year-old children in the United Arab Emirates

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### Abstract

**Objective:** Developmental disabilities are lifelong conditions with considerable public health impact, incurring substantial financial and societal costs. Data on prevalence and associated factors can provide the basis for setting priorities and designing interventions. **Methods:** A representative random sample of 694 United Arab Emirates national children aged 3 years were evaluated in a two-stage epidemiological study. **Results:** Stage 1 screening using the Denver Developmental Screening Test found that 8.4% [confidence interval (CI): 6.4–10.7] had global developmental delay (GDD). Using clinical diagnostic interview in

Stage 2, the weighted prevalence for clinically significant developmental disability was estimated to be 2.44% (CI: 1.28–3.56). GDD was associated with pregnancy and birth complications, poor maternal education, family history of developmental problems, and major traumatic life events, as well as behavioral problems in children. **Conclusion:** Our findings suggest the need for comprehensive and early screening programs for developmental problems, and the importance of training medical and child care professionals accordingly.

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### Introduction

There is considerable variation in the prevalence estimates of mental retardation (MR) across countries and regions, ranging from 2 to 85/1000 [1], and this is attributed at least partly to differences in definitions and ascertainment methods. While some of the differences may be due to such differences in methodology, there are also true differences related to unique sociocultural risk and survival factors. In this regard, one international study that

was designed to allow cross-cultural comparison with identical case-finding procedures and criteria found the rates of MR to be 8.1 per 1000 in Bangladesh, 19.8 per 1000 in Jamaica, and 31 per 1000 in Pakistan [2]. Other studies from India and China have reported rates of 12.4 per 1000 [3] and 2.9 per 1000 [4], respectively, for serious MR. The National Health Interview Survey estimated the prevalence of MR in a noninstitutionalized US population to be 0.78% for the total population, while that for the age group of 0–5 years was found to be 3.84% [5]. However, the rates reported from developing countries are much higher. Durkin et al. [6], in a study in Pakistan, reported the prevalence of MR to be 8.4% (1.9% for serious MR and 6.5% for mild MR). While the reason for differences in developing versus nondeveloping countries is rather com-

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plex, racial and sociocultural characteristics unique to the population seem to play important contributing roles. In this regard, studies from countries with mixed population, such as the United States, have reported considerable variation based on age, race, and sex, with rates of MR ranging from 5.2 per 100, to 16.6 per 100 children, even after controlling for family income and maternal education [7]. Thus, there is some consensus that the prevalence of MR differs by gender, maternal race, socioeconomic status, and educational status [8].

It has also been found that at least some forms of developmental disorders are more common in developing—in particular low-income—countries. In this regard, the United Arab Emirates (UAE) offers a unique challenge in that it is a developing country with a high per-capita income. However, data on the prevalence and risk factors for developmental disorders are not well documented for many of these countries, and the main reasons for the paucity of such data are difficulty in data collection in these settings and the view that developmental disabilities are of low priority in research [9]. Given the fact that many of the unique risk factors that are implicated in developing countries (such as specific genetic diseases, a higher frequency of births in older mothers, consanguinity, trauma, toxic exposures, and specific nutritional deficiencies and infections) [10] are relevant to the UAE, it would seem that the rates in the UAE would be more similar to those in developing countries, despite the economic advantage.

In addition to the differences between low-income countries and industrialized countries, rates of MR have also been observed to be different based on ethnicity. A higher prevalence of MR has been reported among Australian indigenous children [11] and African American children than among children of other racial groups, even after controlling for selected sociodemographic factors such as sex, maternal age, birth order, maternal education, and socioeconomic status [12]. Explanations for such differences have included inappropriate labeling of children from minority cultures and the use of culturally inappropriate IQ tests [13]; increased prevalence of maternal conditions such as diabetes, hypertension, and chronic renal diseases [14]; and postnatal child factors such as lead levels and anemia [15,16]. Other factors include genetic profile and the rate of consanguinity in the population. In this regard, an earlier study from the UAE found that a positive family history [odds ratio (OR)=1.8] and consanguinity (OR=2.2) increased the likelihood of receiving a diagnosis of learning disorder [17].

The UAE lies on the Arabian Gulf and consists of a union of seven emirates. The population of the UAE in 1995 was 2.3 million (Ministry of Health Statistics Annual Report 1995). It is estimated that expatriates make up around 70% of the total population, and the remaining 30% are UAE nationals. About one third of the total population is under 15 years of age. Although there is a fairly good system in place for screening physical disorders among

school-aged children, this is not the case for preschoolers. To the best of our knowledge and according to Medline search, there have been no systematic studies on the nature and occurrence of developmental disorders in preschool children in this Arabian Gulf region, including the UAE. Understanding the prevalence of these disorders will not only help plan the necessary health services but also aid in reducing the public health burden of these conditions. Furthermore, ascertaining individual, psychosocial, and family risk factors will provide important clues to the predisposing, precipitating, and maintaining factors that are relevant to this community. Identifying such variables, in turn, has implications for developing services aimed at prevention and early intervention.

## Method

The study sample was provided by the Central Department of Statistics, Ministry of Planning (Abu Dhabi, UAE). Of the seven emirates constituting the UAE, three emirates, namely, Dubai, Al Ain in Abu Dhabi Emirate, and Ras Al-Khaimah, were chosen in order to get a fair representation of the urban, semiurban, and rural populations. The authors were provided a random representative sample of 2000 UAE national households. This sample was a subsample of a master sample of 4000 households drawn from the UAE 1995 population census. The sampling frame was updated in 1998 to include new UAE national households. The master sample had been validated to provide reliable estimates at the national level. Only UAE national children were included in the study in the hope that this would reduce the effects of sociocultural, economic, and racial factors in relation to the expatriate population and the influence of migration on morbidity rates.

### *Operational definition of developmental disability*

As described earlier, the definition, classification, and measurement of serious developmental disabilities such as MR have involved considerable controversy over time, with a debate about the term itself and whether it is wise to lump together a group of heterogeneous disorders into a single entity [18]. Although often used interchangeably, the terms *MR* and *developmental disability* have different operational definitions in that MR is determined through established professional protocols for determining that the individual has a significantly subaverage IQ and concomitant limitations in social and behavioral skills [5]; on the other hand, developmental disability is defined by the presence of functional limitations in two or more adaptive skill areas: communication, self-care, home living, social skills, community use, self-direction, health and safety, functional academics, and leisure and work [19]. This definition lacks the standardized practices and instruments associated with the determination of MR [5]. In this regard, the focus of this study was developmental disability rather than MR.

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