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ORIGINAL PAPER

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Prevalence of emotional and behavioural problems among 6–12 year old children in Egypt

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Abstract Epidemiological information about prevalence of child mental health problems is essential to inform policy and public health practice. This information is weak in many developing countries and those in developmental transition. There have been few such studies in Arab countries and none in Egypt. We conducted a population prevalence study of emotional and behavioural disorders among 1186 6–12 year old children in Minia, Egypt. Data was collected from teachers and parents using the Strengths and Difficulties Questionnaire with a 98 and 91% response respectively. Prevalence of abnormal symptom scores is reported for both parents and teachers. Prevalence of probable psychiatric diagnoses was measured using the SDQ multi-informant algorithm. These prevalences have then been compared to published UK data. The prevalence of emotional and behavioural symptoms was high as reported by both parents and teachers (Abnormal total difficulties: teachers 34.7% (95% CI 32.0–37.5), parents 20.6% (18.2–23.2). Abnormal prosocial scores: teachers 24.9% (22.5–27.5), parents 11.8% (9.9–13.9)) but prevalence of probable psychiatric diagnoses was much lower (Any psychiatric diagnosis 8.5% (6.9–10.5); Emotional disorder 2.0% (1.2–3.0); Conduct disorder 6.6% (5.1–8.3); Hyperactivity disorder 0.7% (0.3–1.4)). Comparison with UK data showed higher rates of symptoms but similar rates of probable disorders. Despite public, professional and political underestimation of child mental health problems in Egypt, rates of symptoms are higher than in developed countries, and rates of disorders are comparable. These findings support greater investment in community and primary care prevention and treatment initiatives.

Key words children – emotional and behavioural disorders – mental health – developing countries – Egypt

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Introduction

Emotional, behavioural and psychiatric problems in children are a substantial public health problem in developing countries despite being less extensively studied and monitored than causes of physical mortality and morbidity such as infection, nutrition and injury [11, 25, 27]. The contribution of emotional, behavioural and psychiatric disorders to the overall burden of morbidity has been more widely examined in developed countries with an overall prevalence of around 12% [8]. Emerging evidence from developing countries in many of the regions of the world suggests similar levels of morbidity although robust epidemiological evidence is poor [7, 21, 28]—as it is for many other causes of mortality and morbidity [29]. Data from Arab countries are particularly poor, with minimal research directed towards child and adolescent mental health.[3] Limited data is available from a few studies carried out in the United Arab Emirates, [9] Gaza,[31] and the Yemen [6]. It is inappropriate to extrapolate prevalence rates between these countries because some, but not all, are going through periods of social and political upheaval, wars and oppression, all of which can have profound effects on children's mental health [32].

Having accurate and up-to-date information about the prevalence of child mental health problems is

important in determining and influencing the health policy of these countries. As countries move through developmental transition, patterns of morbidity change and come to resemble those of more developed nations. The processes of urbanisation and industrialisation are thought to increase the risks for childhood emotional and behavioural problems [26]. These changes can be relatively rapid, and hence there is a risk that preventive and therapeutic resources do not reflect the health priorities within a country.

This may be the case in Egypt. Egypt is a well into the cycle of development, and the child health problems reflect this with falling rates of mortality, infection and malnutrition [36]. However, there is a widespread belief among parents, child health professionals, and politicians in Egypt that mental health disorders in children are not a major public health problem [1, 3, 10, 22]. Reasons put forward include the stability of family life, social tradition and general factors related to the Islamic culture. This is reflected in very limited investment in child mental health services [22].

Data from Egypt on the prevalence of child mental health problems is restricted to information from a few disorder-specific studies such as anxiety disorders [23] and depression.[2] Costello et al. [8] have argued that there are now a wide range of methods for assessing prevalence of child and adolescent psychiatric disorders which are valid and reliable. One of these—the strengths and difficulties questionnaire (SDQ) [12, 35]—has been used in many countries of the world and has been translated into Arabic and validated in an Arab country [4, 5]. Two other advantages of the SDQ are that it collects information from multiple informants and so reflects children's emotional and behavioural symptoms in different settings, and, by using all the information from all respondents, enables an epidemiological approximation to be made of psychiatric diagnoses as well as simply symptoms [14, 15, 18]. We have conducted a prevalence study in a representative district in Egypt using the SDQ in order to provide accurate and contemporaneous data on rates of emotional and behavioural symptoms and of probable psychiatric disorders among children in primary school aged 6–11 years. We also have incorporated an analysis of social and demographic risk factors, and compared the prevalence and risk factors with data from the UK.

Methods

Setting

The study was carried out in the district of Minia, the main district in the governorate of Menya in Upper Egypt. Menya's population is broadly representative of that of Egypt as a whole. The population of Menya is approximately four millions with 40% being under the age of fifteen and nearly two thirds of the schools are in rural areas. The unemployment rate and population growth rate are almost the same as for Egypt as a whole as is the average class size (44 compared with 42) and proportion of the child population in private schooling (5.5% compared with 8.0%).

Sampling

A two-stage cross-sectional survey was conducted. Sample size of around 1,200 was determined in order to measure a population prevalence of between 10 and 20% with a maximum deviation of 2%. The Education Authority provided us with a list of the district's 171 primary schools stratified into rural and urban. Urban schools were further stratified into public and private schools. The first stage of the study involved random selection of schools from each stratum. In the second stage pupils were randomly sampled from each class of selected schools. Ten schools were selected, five rural and five urban, one of these being a private school. This reflected the overall proportion of school types within Minia. All ten schools agreed to participate. Within grades 1–6 (ages 6–12) of each school, we randomly sampled 20–22 children from each grade. The sample was divided to cover all classes of the same grade. Parents were informed of the study formally by letter and informally by verbal messages from the school secretary. With the letter they were sent questionnaires (see data collection instruments below), and their return of questionnaires was considered as consent. Ethical approval for the study was sought from the Minia Health Authority, which replied that this was not required under their regulations. Approval was obtained from the Regional Educational Authority of the Governorate of Minia. In addition, ethical approval was obtained from the Research Ethics Committee of the Faculty of Health at the University of East Anglia.

Data collection instruments

For each child, a parent and the teacher were asked to complete the Arabic version of the extended SDQ [13]. This is a brief behavioural questionnaire that includes 25 core items and supplemental questions on impact. The 25 items generate five scales: emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems, and prosocial behaviour. Each of these scales is scored from 0 to 10 and can be classed as "normal", "borderline", or "abnormal" depending on how the score compares with population standards based on original validation work in the UK [13, 14]. All but the last scale are summed to generate a total difficulties score ranging from 0 to 40. The impact supplement enquires about chronicity, distress, social impairment, and burden for others. The Arabic version of the SDQ has been validated previously [4, 5, 31]. A standardised computer algorithm to predict child psychiatric disorders has been developed which uses information on symptoms and impact from all the available informants (in this case both parents and teachers) for any individual child [14, 15]. This distinguishes between three groups of disorders, namely conduct-oppositional disorders, hyperactivity-inattention disorders, and anxiety-depressive disorders. Each is predicted to be "unlikely", "possible" or "probable". Predictions of the three groups are combined to generate an overall prediction of the presence or absence of any psychiatric disorders.

In addition parents received a brief demographic and social questionnaire covering the child's age, gender, birth order, number of siblings, whether there were one or two parents at home, and whether the child had received professional psychological help. The questionnaire also asked about the type of employment of both parents and the educational attainment of both parents. Finally, a separate questionnaire to the child's teacher enquired of their academic achievement.

Data collection

Data was collected over 6 weeks in March and April 2005. Where possible, parents completed their questionnaires independently. Due to high illiteracy rates among rural parents, questionnaires were administered through interviews either at the school or in the

Table 1 Characteristics of response group

Characteristic	Number (%)
Parent questionnaires complete	1,077 (90.8)
Teachers questionnaires complete	1,167 (98.4)
Predictors complete	1,048 (88.4)
Gender	
Male	606 (51.5)
Female	571 (48.5)
Age	
6 year	114 (9.7)
7 year	202 (17.2)
8 year	189 (16.1)
9 year	215 (18.3)
10 year	212 (18)
11 year	174 (14.8)
12 year	71 (6)
Location	
Urban	586 (49.8)
Rural	591 (50.2)
Sector	
Public	1,070 (90.9)
Private	107 (9.1)
Level of maternal education	
Illiterate/primary	585 (58)
Secondary/vocational	313 (31.1)
University& above	110 (10.9)
Level of paternal education	
Illiterate/primary	416 (42.4)
Secondary/vocational	425 (43.3)
University& above	140 (14.3)
Maternal occupation	
House wife	798 (78.5)
Labourer	16 (1.6)
Semiskilled/semi professional	114 (11.2)
Skilled/professional	88 (8.7)
Paternal occupation	
Unemployed	148 (15)
Labourer	187 (19)
Semiskilled/semi professional	480 (48.8)
Skilled/professional	169 (17.2)

parents' home. The interviewers were either the school secretary or school social worker who were given instructions by the investigator about how to ensure consistency and avoid bias in filling the questionnaires.

Analysis

The results from the five subscales of the SDQ, the total difficulties score, and the impact score were classified using the standardised cutoff values into "abnormal" or "not abnormal" (i.e. "borderline" and "normal" combined). Predicted psychiatric diagnoses were classified as "probable" or "not probable" (i.e. "possible" and "unlikely" combined). Prevalence values were calculated along with their 95% confidence intervals and were compared using the 95% confidence intervals of differences in proportions. Analysis of predictive factors was conducted using multiple linear regression. Prevalence rates from this Egyptian sample were compared to an identical age group sample of 6,868 British children using the same measures; the British sample is a subgroup extracted from a larger national study [19] and data from this study are available from the UK data archive (http://www.data-archive.ac.uk).

Data analyses were carried out using the Statistical Package for Social Scientists (SPSS version 12) and the Stats Direct statistical software (http://www.statsdirect.com).

Results

A total of 1,186 children, aged 6–12 years, were selected from the ten schools. Overall, in 1,177 cases either one or both of the informants responded. Information on the Strengths and Difficulties Questionnaire was provided by teachers for 1,167 (98.4%) of the children and by parents for 1,077 (90.8%). There was data from one or other informant in 1,177 of the children and data from both teacher and parent in 1,067 (90.0%) of the children. There was no difference in response rates from teachers between rural and urban schools, but there was for parents, with data for 98.7% of children in rural schools compared with 83.1% for children in urban schools. Table 1 presents characteristics of the response group.

Table 2 summarises the results from the parent and teacher completed SDQs. The top section of the table describes the prevalence of abnormal symptom and impact scores while the lower section describes the prevalence of probable psychiatric disorders as defined by the multi-informant algorithm. Teachers rated their pupils consistently as showing difficulties in all areas with 34.7% of the children considered to be displaying abnormal behaviour. The highest proportion of abnormal behaviour was for conduct problem with 27.7% of the children rated as in the "abnormal" category. Parents rated their children as having fewer problems than rated by teachers, but rates were still high with 20.6% of the children receiving total difficulty scores in the abnormal band. The most problematic areas as assessed by parents were peer relations followed by conduct problems. Although the prevalence of problem behaviours was high, the prevalence of probable psychiatric diagnoses was much lower. The reason for the discrepancy is the lower prevalence of abnormal impact scores, which determine the burden caused by problem behaviour, in other words its severity. The predictive algorithm depends to a considerable degree on the modifying effect of the impact scores [14, 15].

Table 3 compares the prevalence of probable child psychiatric disorders in Egypt and Britain as assessed by teachers and parents using the multi-informant SDQ algorithm. The reported prevalence of behaviour problems by both teachers and parents is much higher in Egypt than in Britain. Nevertheless, estimated prevalence rates of

Table 2 Abnormal problem scores and probable psychiatric diagnoses from the parent and teacher completed SDQ, values are percentage prevalence (number and 95% confidence intervals in parentheses)

Score	Teacher assessed (n = 1,167)	Parent assessed (n = 1,077)
Abnormal SDQ scores		
Total difficulties	34.7% (405, 32.0–37.5%)	20.6% (222, 18.2–23.2%)
Emotional problems	15.3% (179, 13.3–17.5%)	21.2% (228, 18.8–23.7%)
Conduct problems	27.7% (323, 25.1–30.3%)	25.3% (272, 22.7–28.0%)
Hyperactivity symptoms	16.4% (191, 14.3–18.6%)	10.7% (115, 8.9–12.7%)
Peer problems	23.7% (276, 21.2–26.2%)	33.8% (364, 31.0–36.7%)
Prosocial scale	24.9% (291, 22.5–27.5%)	11.8% (127, 9.9–13.9%)
Impact score	9.2% (107, 7.6–11.0%)	7.8% (84, 6.3–9.6%).
Probable psychiatric diagnoses based on multi-informant algorithm (n = 1,067)		
Any psychiatric diagnosis	8.5% (91, 6.9–10.5%)	
Emotional disorder	2.0% (21, 1.2–3.0%)	
Conduct disorder	6.6% (70, 5.1–8.3%)	
Hyperactivity disorder	0.7% (7, 0.3–1.4%)	

Table 3 comparing prevalence of child mental health problems in Egypt and Britain

Measure of child mental health problem	Egypt (6–12 year)	Britain (6–12 year)	Difference (95% confidence interval)	*P*
Abnormal parent "total difficulties"	20.6% (222/1,077)	10.1% (684/6,779)	10.5% (8.1 –13.1)	<0.001
Abnormal teacher "total difficulties"	34.7% (405/1,167)	9.8% (544/5,551)	24.9% (22.1–27.8)	<0.001
Multi informant "any psychiatric" diagnosis	8.5% (91/1,067)	10.4% (571/5,482)	-1.9% (−3.6–0.1)	0.06
Multi informant "emotional disorder"	2% (21/1,067)	3.1% (171/5,482)	-1.2% (−2.0 to −0.05)	0.038
Multi informant "conduct disorder"	6.6% (70/1,067)	6.1% (336/5,482)	0.4% (−1.1 to 2.2)	0.53
Multi informant "hyperactivity disorder"	0.7% (7/1,067)	3.1% (168/5,482)	−2.4% (−3.0 to −1.6)	<0.001

probable psychiatric diagnoses are similar between Egypt and the UK when the multi-informant algorithm from both parents and teachers reports are used. This reflects the comparable rates of abnormal impact scores between this Egyptian sample and the British comparison (where parents rated 8.7% of children with an abnormal impact score and teachers rated 11.1%). Probable hyperactivity disorders were noted to be less frequent in the Egyptian sample, although Egyptian parents and teachers both reported similar rates of hyperactivity symptoms to their counterparts in Britain.

Table 4 describes the univariate associations between the teachers and parents total difficulty scores and a range of potential socio-demographic and educational risk factors. For the teacher assessment of total difficulties, associations with child variables were found for male gender, lower academic achievement, lower paternal and maternal educational attainment, and low status paternal and maternal occupation, all being associated with higher difficulty scores. For the parental assessment of total difficulties, there were fewer significant associations but poor academic achievement, lower maternal educational attainment (although not illiteracy) and living with a lone parent were associated with higher difficulty scores. All 11 factors from Table 4 were entered into a general linear regression model with the child's school entered as a dummy variable. The factors that were still associated with abnormal total difficulty score were the child's academic ability ($P = 0.000$) in both parents and teachers' assessment. Male gender ($P = 0.001$) was still significant in the teachers assessment model while living with a lone parent ($P = 0.001$) was still significant in the parents' assessment model.

Discussion

We have shown that the prevalence of probable child psychiatric disorders in 6–12 year old children in Egypt is similar to that in the UK and many other developed and developing countries. Furthermore, our analyses also suggest that the determinants of

Table 4 Univariate associations between potential risk factors and abnormal total difficulties score

Risk factors	Categories	Abnormal total score (teacher)	Odds Ratio (95% confidence interval)	Abnormal total score (parent)	Odds ratio (95% confidence interval)
Gender	Male	41.3% (248/601)	1.83‡ (1.43–2.34)	22% (120/ 545)	1.19 (0.89–1.60)
	Female	27.7% (157/566)	1	19.2% (102/ 532)	1
Academic achievement	Excellent/very good	12.7% (9/71)	1	5% (3/60)	1
	Good	21.7% (86/396)	1.91 (0.93–3.94)	15.2% (57/ 376)	3.39* (1.09–9.05)
	Average	36.3% (157/432)	3.93‡ (1.93–8.02)	21.7% (85/392)	5.26† (1.70–16.2)
	Weak/very weak	59.7% (135/226)	10.2‡ (4.90–21.3)	32.7% (66/202)	9.22‡ (2.95–28.7)
Father's education	Illiterate/primary	40.9% (169/413)	2.06‡ (1.34–3.16)	22.2% (92/414)	1.71 (1.02–2.89)
	Secondary/vocational	31.2% (131/420)	1.35 (0.87–2.08)	20.5% (87/425)	1.54 (0.91–2.61)
	University & above	25.2% (35/139)	1	14.3% (20/140)	1
Mother's education	Illiterate/primary	39.8% (231/581)	1.86† (1.18–2.95)	20.4% (119/583)	1.51 (0.86–2.64)
	Secondary/vocational	27.4% (85/310)	1.07 (0.65–1.75)	24.3% (76/313)	1.88* (1.05–3.38)
	University & above	26.2% (28/107)	1	14.5% (16/110)	1
Father's job	Unemployed	46.9% (69/147)	2.40‡ (1.50–3.84)	20.9% (31/148)	1.28 (0.73–2.24)
	Labourer	32.1% (60/187)	1.28 (0.81–2.03)	23.2% (43/185)	1.46 (0.87–2.46)
	Semiskil/semi prof.	33.5% (159/474)	1.37 (0.93–2.02)	20.2% (97/480)	1.22 (0.78–1.93)
	Skilled/ professional	26.9% (45/167)	1	17.2% (29/169)	1
Mother's job	House wife	35.4% (280/791)	1.32 (0.81–2.14)	21.4% (170/796)	1.72 (0.92–3.21)
	Labourer	62.5% (10/16)	4.0* (1.35–11.8)	31.3% (5/16)	2.88 (0.89–9.44)
	Semiskill/semiprof.	26.3% (30/114)	0.86 (0.46–1.60)	22.8% (26/114)	1.87 (0.89–3.92)
	Skilled/professional	29.4% (25/85)	1	13.6% (12/88)	1
Living with parents	Both	33.9% (335/987)	1	20.2% (201/995)	1
	One	39.6% (19/48)	1.28 (0.71–2.29)	33.3% (16/48)	1.98* (1.07–3.64)
	None	0% (0/3)		66.7% (2/ 3)	NA§
No. of children in family	1	28.6% (6/21)	1	33.3% (7/21)	1
	2–5	32.9% (280/850)	1.23 (0.49–3.10)	21.1% (181/859)	0.53 (0.22–1.31)
	>5	43% (58/135)	1.88 (0.71–4.99)	17.2% (23/134)	0.41 (0.15–1.11)
Birth order (21 only child were excluded)	Oldest	31.6% (62/196)	1	20.3% (40/197)	1
	Middle	34.5% (189/548)	1.14 (0.80–1.61)	19.5% (108/553)	0.95 (0.64–1.43)
	Youngest	36.4% (87/239)	1.24 (0.83–1.84)	23.2% (56/241)	1.19 (0.75–1.88)

*$P < 0.05$; †$P < 0.01$; ‡$P < 0.001$
§No odds ratio calculated due to very small numbers

psychiatric disorders are broadly similar in Egypt to those found in other countries. The prevalence of problem symptoms, however, is much greater among Egyptian children, whether perceived by teachers or parents. This discrepancy is explained by the impact of the higher rates of behavioural and emotional symptoms being relatively low. A similar pattern of results was found in the community group of an equivalent study in Pakistan [30]. Although their study collected only parents' reports, the abnormal rates were even higher on the SDQ (34.5%) and were not so when the algorithm was used (8.5%). Mullick and Goodman [20, 21] in their studies in Bangladesh have also stressed the importance of collecting information from two informants and using the multi-informant algorithm. It is possible that this pattern of a high prevalence of problem symptoms is a specific feature of developing Islamic countries during the period of transition.

Strengths and weaknesses of the study

The strengths of this study are the large numbers of children assessed, the high rate of response from parents and teachers, and the standardised questionnaire used which allows comparisons with results from other countries and cultures. We believe our sample is representative of the Egyptian population, with the possible exception of urban Cairo. Although the SDQ has been validated and used in a small number of previous Arab studies, our study is the first epidemiological survey on a large scale using the SDQ in any Arab country.

The weaknesses of the study are that no independent confirmation of the diagnosis was made in children identified with probable disorders, the use of interviewers to assist parents with poor literacy which may have introduced a rural/urban bias, the omission of data from children who do not attend school, which in Egypt was estimated as around 3% in 2005, [34] and the use of UK standards and cutoff criteria to identify problems and diagnoses. As we argue below, all of these would tend to underestimate the actual prevalence of psychiatric diagnoses among Egyptian children.

With respect to confirmation of diagnoses, the algorithm has been validated in both developed [14, 18] and developing countries, [15, 21] and shown to have similar properties in both these settings. While the Strengths and Difficulties Questionnaire responses may not be appropriate to diagnose disorders in individual children, at a population level the prevalence of disorders is likely to be accurate.

Regarding the use of interviewers, these may have influenced parental responses to some extent although they were trained by one of the authors to avoid this. Mullick and Goodman [20] in a study from Bangladesh with similar high rates of parental illiteracy have recommended that the SDQ questions are read out and the answers recorded by interviewers. Our results suggest this may have introduced some bias: teachers' questionnaire scores were similar in both rural and urban schools, whereas rural parents reported fewer abnormal scores than did urban parents. Studies from elsewhere show generally lower rates of emotional and behavioural difficulties among rural children [21, 26] so the differences we have found may reflect true differences rather than bias. We have not reported rural/urban comparisons in this paper, but even if interview reports did introduce some bias, it is unlikely to have influenced the overall findings other than to slightly underestimate the true prevalence of psychiatric disorders.

We recognise that omitting children not attending school may have underestimated the prevalence of psychiatric disorders as these children are at much greater risk of this in both developed and developing countries. These families are often socially excluded in many other ways and so reaching them to carry out any assessment, even using a simple questionnaire, would require other research methods.

The use of a UK developed questionnaire and UK criteria and cutoff values could be criticized for being culturally inappropriate. The translation of questions has been validated, but parents and teachers may have different expectations of children in different countries and cultures. This may explain the discrepancy between the very high problem scores but the low normal impact scores. However, emotional and behavioural problems, and child psychiatric diagnoses are to some extent culturally determined anyway [16, 33]. For the purposes of international comparisons it is important to use common measurement tools and criteria, whether or not the results are considered artificially high or low in the different cultural settings. In the context of the Strengths and Difficulties Questionnaire, it is likely that the problems scores are more culturally neutral than the impact scores, which suggests again that the prevalence of child psychiatric diagnoses may be underestimated in the Egyptian children. On the other hand, the school environment in Egypt is very different to that in developed countries. Precise class sizes were not available for our data collection, but Egyptian school class sizes are around 40–60 children, with a single teacher to teach, keep order, and nurture those students who are having difficulties. It is hardly surprising that high rates of externalising problem behaviours are reported by teachers among their students and this might account for the greater problem rates. Similarly, some parental expectations are of stricter self control among younger children, leading to higher rates of perceived (but perhaps non-pathological) problems.

Implications for policy

Egypt is a developing Arab country undergoing rapid transition with a predominantly Muslim religion and culture. The Egyptian public, child health and education professionals, and policy makers have underestimated the prevalence and public health impact of child mental health problems, and this is reflected in the low level of investment in child mental health services, particularly within the community and primary care. Egypt is not alone among developing countries in this. It has been argued that the Muslim culture tends to protect children from mental health problems, particularly in a stable country that is not suffering war, conflict, famine or political turmoil. Our findings suggest this is not the case. Egyptian children are just as much at risk of mental health problems as those in many other developed and developing countries. Health and childhood related policy in Egypt should reflect this. We are not arguing for high level specialist child mental health services, but much greater investment, training and recognition of community based low-level services which have a preventive or early intervention emphasis [17, 24, 25]. There may also be a case for school based support services, since the presenting symptoms are high in school, and any risk to educational attainment is undesirable to a country trying to raise the level of skills in its population.

Finally, information for the public is required. The notion that these are not problems for large numbers of Egyptian children needs to be dispelled, and the view that these children are badly behaved, or that their parent's are at fault needs to be countered. Changing public opinion and knowledge is likely to be the surest way of influencing policy at a local and national level.

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