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Pedestrian Traffic Deaths Among Residents, Visitors, and Homeless Persons — Clark County, Nevada, 2008–2011

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Motor vehicle collisions and crashes are a leading cause of death among Nevada residents aged 5–34 years, representing 14% of all injury deaths in that age group in 2010 (*1*). During 2008–2011, a total of 173 pedestrian deaths from motor vehicle collisions occurred in Nevada, accounting for 16% of motor vehicle deaths in the state (*2*). Approximately 75% (2 million persons) of Nevada residents live in Clark County, which includes the city of Las Vegas. To analyze pedestrian traffic deaths in Clark County among residents, visitors, and homeless persons, the Southern Nevada Health District used coroner's office data and death certificate data for the period 2008–2011. The results indicated that the average annual pedestrian traffic death rates from motor vehicle collisions during this period were 1.4 per 100,000 population for residents, 1.1 for visitors, and 30.7 for homeless persons. Among the three groups, time of day, location of motor vehicle collisions, and pedestrian blood alcohol concentration (BAC) differed. Effective interventions to increase roadway safety, such as lowering speed limits in areas with greater pedestrian traffic, targeting interventions during hours when alcohol-impaired walking is more likely, and modifying roadway designs to increase protection of pedestrians, might decrease pedestrian deaths among all three groups.

Clark County death certificate data for 2008–2011 includes all deaths of Clark County residents and all deaths occurring in Clark County. All motor vehicle–related deaths, including pedestrian deaths, occurring in Clark County are investigated by the Clark County Office of the Coroner/Medical Examiner. A motor vehicle traffic–related pedestrian death was defined as the death of a nonoccupant (i.e., a person on foot, in a wheelchair, or on a skateboard) within 30 days of being struck by a motor vehicle in transit on a public trafficway in Clark County, Nevada. Pedestrian deaths were identified in coroner's office data and death certificate data independently, and discrepancies were reconciled through case reviews. Demographic information was obtained from death certificate data. Residence status, collision location, and BACs were abstracted from coroner's office case reports.

Annual resident pedestrian death rates per 100,000 population were calculated by using 2008–2011 Nevada state census data and analyzed by age group and race/ethnicity. Pedestrian death rates for visitors aged ≥20 years per 100,000 population were calculated by using 2008–2011 Las Vegas Convention and Visitors Authority profiles. Visitor person-year estimates were calculated by multiplying the estimated number of yearly visitors aged ≥20 years by the average number of days and nights stayed and dividing by 365. Homeless pedestrian death rates per 100,000 population per year were calculated by using 2009 and 2011 homeless census surveys that provided point-in-time estimates of both sheltered and unsheltered homeless persons

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in Clark County (*3*). Because the homeless census survey is only performed every other year, 2008–2011 denominators were calculated using the census for 2009 (13,338) as the denominator for 2008–2009 and the census for 2011 (9,432) as the census for 2010–2011 (*3*).

The death certificate race/ethnicity variable includes seven mutually exclusive categories: white, black, American Indian, Asian, Hispanic, other, and unknown. Geographic location of collision was abstracted from coroner's office data in one of three formats: street address, interstate name and mile marker, or intersection of two roads. Collision sites were mapped for those collisions occurring within a 22-mile (35-km) radius of Las Vegas Boulevard and Flamingo Road (a main intersection centrally located in the county). Time of collision was categorized as midnight–5:59 a.m., 6:00 a.m.–11:59 a.m., noon–5:59 p.m., and 6:00 p.m.–11:59 p.m. BACs from coroner's office data for those aged ≥16 years were categorized as zero, 0.01–0.07 g/dL, and ≥0.08 g/dL. Pedestrians with BACs of ≥0.08 g/dL were considered impaired.

During 2008–2011, a total of 140 pedestrian traffic deaths occurred in Clark County; decedents were 107 residents, 19 visitors, and 14 homeless persons (Table 1). Excluding one fetal death, the median age for decedents was 50 years (range = 6–93 years); 100 (71%) of the decedents were male. Annual rates of pedestrian deaths among residents, visitors, and homeless persons were 1.4, 1.1, and 30.7 per 100,000 population, respectively. Death rates increased with age among residents, and those aged ≥60 years had higher rates than those in younger age groups (Table 1). Age group–specific death rates could not be calculated for visitors or homeless persons because age-specific census data for these groups were not available. Among residents, death rates per 100,000 population were highest among blacks (2.8), followed by whites (1.4), Pacific Islanders (1.0), and Hispanics (0.9) (Table 1).

Fatal collision sites among resident pedestrians were distributed throughout the urban areas of the county (Figure). Among visitors, collision sites were concentrated near the tourist area referred to as "The Strip," along Las Vegas Boulevard and Interstate 15. Among homeless persons, collision sites were concentrated in northeastern Las Vegas.

The greatest percentage of pedestrian deaths among residents and homeless persons occurred during 6 p.m.–11:59 p.m. (residents: 41.1%; homeless persons: 78.6%). Visitor pedestrian deaths were more equally distributed throughout the day, peaking during midnight–5:59 a.m. (36.8%) (Table 2). Among the 122 decedents aged ≥16 years with BACs recorded, BAC ranges were 0–0.37 g/dL for residents, 0–0.34 for visitors, and 0–0.40 for homeless persons (0–0.40 g/dL overall). Overall, 32.0% of the decedents had a BAC of ≥0.08 g/dL, indicating impairment (26.4% among residents, 64.3% among homeless persons, and 35.3% among visitors) (Table 2). The proportion of alcohol impaired pedestrians was significantly greater ($p<0.01$) among homeless pedestrians, compared with residents.

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TABLE 1. Number of pedestrian traffic deaths and average annual death rates,* among residents, visitors, and homeless persons, by age group and race/ethnicity — Clark County, Nevada, 2008–2011

	Residents		Visitors		Homeless persons	
Characteristic	**No.**	**Rate**	**No.**	**Rate**	**No.**	**Rate**
Overall pedestrian traffic deaths (N = 140)	**107**	**1.4**	**19**	**1.1**	**14**	**30.7**
Age group (yrs)						
≤19	14	1.2	—†	—	—†	—
20–39	17	0.6	8	—	—†	—
40–59	38	0.9	8	—	11	—
60–79	30	1.5	—†	—	—†	—
≥80	7	2.2	—†	—	—†	—
Race/Ethnicity§						
White	60	1.4	11	—	10	—
Black	20	2.8	—†	—	—†	—
Asian	—†	—	—†	—	—†	—
Pacific Islander	6	1.0	—†	—	†	—
Hispanic	20	0.9	—†	—	—†	—

* Average annual death rates per 100,000 population for residents and homeless persons and average death rates per 100,000 person-years for visitors. Visitor overall death rate includes only persons aged ≥20 years.
† Subgroup values ≤5 were suppressed in accordance with state health department policy.
§ Persons categorized as white, black, Asian, and Pacific Islander were all non-Hispanic. Persons categorized as Hispanic might be of any race.

Discussion

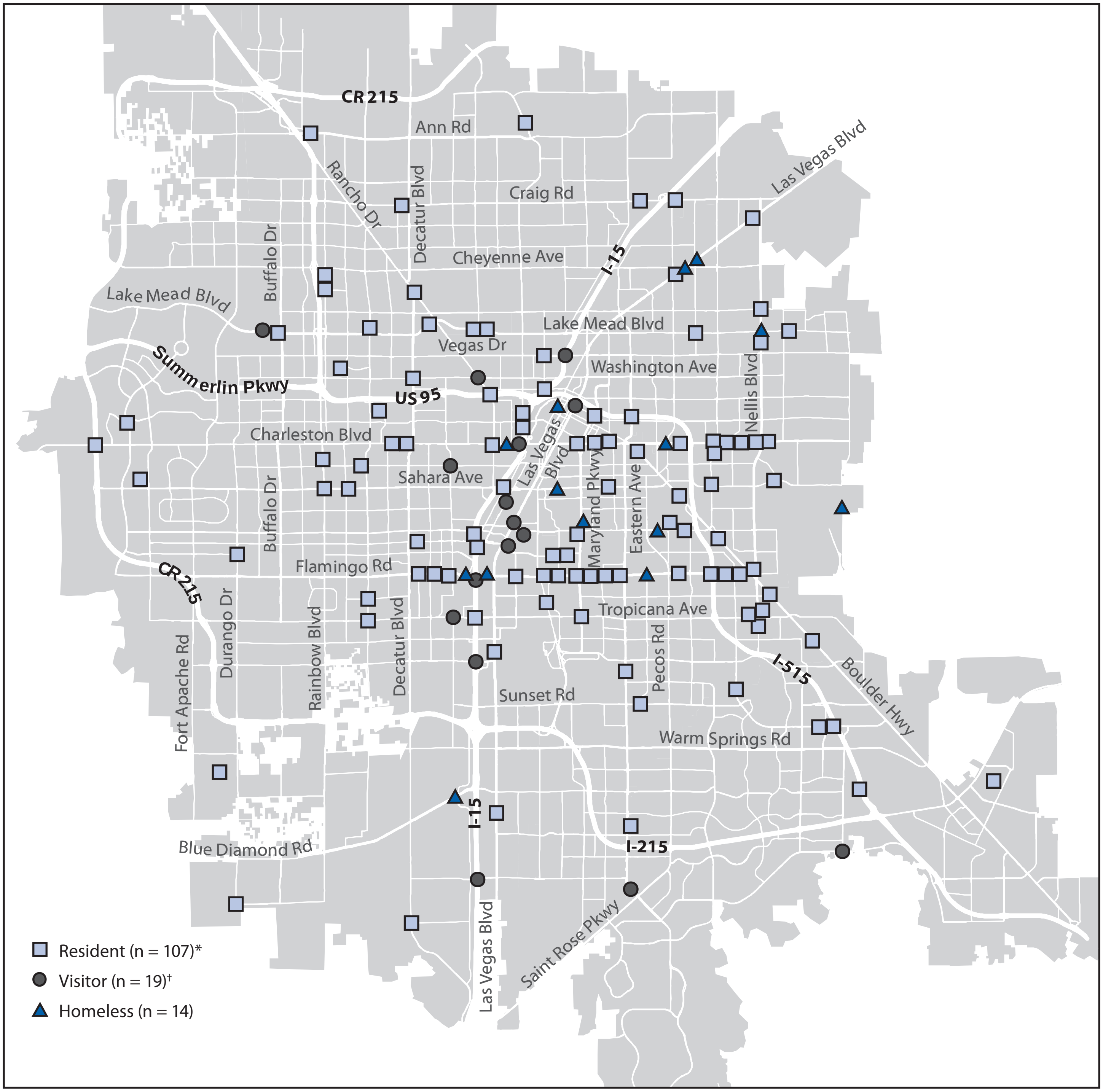
The findings in this report indicate differences in pedestrian traffic deaths among residents, visitors, and homeless persons in Clark County during 2008–2011. Among the three groups, homeless persons had much higher pedestrian death rates. Although coroner's office data did not specify whether a homeless decedent was sheltered or unsheltered, 78.6% of homeless pedestrian deaths occurred after homeless shelter curfews (6 p.m.). Nevada's proportion of unsheltered homeless persons (60%) is among the highest of any state and twice the national proportion of unsheltered homeless (30%) (*3*). Therefore, the unsheltered homeless population might be at greater risk for pedestrian death in Clark County.

Increases in resident pedestrian death rates with age are consistent with previous studies (*4*,*5*). Differences in age distribution among resident and visitor pedestrian deaths might result from differences in walking patterns, familiarity of streets and terrains, and alcohol consumption patterns. In this report, the finding that resident blacks had higher death rates, compared with whites and Hispanics, might be attributable to differences in walking patterns or neighborhood characteristics, but this has not been documented. Other studies have identified variation in pedestrian death rates among racial/ethnic groups (*5*). Geographic differences in the collision sites among residents, visitors, and homeless persons likely mirror different walking patterns among the three groups. Evidence-based interventions should be considered, including those that target driver and pedestrian behavior and those that provide dedicated infrastructure (e.g., refuge islands and raised medians) for pedestrians.

Similar to previous studies, approximately one third of all pedestrian deaths in this study were associated with alcohol-impaired walking; further implementation and evaluation of interventions targeting this group are needed (*4*,*6*). Pedestrians who have consumed alcohol are at greater risk for being fatally or seriously injured (*7*). Although research on effectiveness is limited, interventions that might reduce deaths related to pedestrian alcohol impairment include public awareness campaigns, along with legislative approaches (e.g., limiting availability of alcohol or prohibiting public intoxication), programs for early identification and treatment of persons with alcohol problems, and environmental interventions (e.g., improved lighting and speed control measures) (*8*). *The Guide to Community Preventive Services* recommends electronic screening and brief intervention. This intervention, which can be administered in almost any setting, involves use of electronic devices (i.e., computers, telephones, and mobile devices) to screen for excessive drinking and to deliver a brief intervention with personalized feedback about risks and consequences (*9*).

The World Health Organization's pedestrian safety manual recommends six categories of pedestrian safety interventions: reducing pedestrian exposure to vehicular traffic, reducing vehicle speeds, improving the visibility of pedestrians, improving pedestrian and motorist safety awareness and behavior, and providing care for injured pedestrians (*10*). Proven interventions should be based on the needs in particular geographic locations and might include constructing pedestrian refuge islands and raised medians, upgrading traffic and pedestrian signals, constructing overpasses or underpasses, installing speed management measures, and developing and enforcing traffic laws (*10*).

FIGURE. Pedestrian traffic deaths, by residence status — Clark County, Nevada, 2008–2011



* Three resident fatalities in rural area of county not shown.
† Three visitor fatalities in rural area of county not shown.

The findings in this report are subject to at least four limitations. First, some visitor pedestrians might have been injured in Clark County but subsequently died elsewhere, although such events likely would be rare and have a negligible effect on the visitor pedestrian death rate. Second, the accuracy of visitor profiles and homeless census surveys has not been assessed, which might result in overestimation or underestimation of pedestrian death rates for those groups. Third, pedestrian

TABLE 2. Number and percentage of pedestrian traffic deaths among residents, visitors, and homeless persons, by time of day and blood alcohol concentration — Clark County, Nevada, 2008–2011

	Residents		Visitors		Homeless persons		Overall	
Characteristic	**No.**	**(%)**	**No.**	**(%)**	**No.**	**(%)**	**No.**	**(%)**
Time of day								
Midnight–5:59 a.m.	23	(21.5)	7	(36.8)	1	(7.1)	31	(22.1)
6:00 a.m.–11:59 a.m.	14	(13.1)	5	(26.3)	1	(7.1)	20	(14.3)
Noon–5:59 p.m.	26	(24.3)	3	(15.8)	1	(7.1)	30	(21.4)
6:00 p.m.–11:59 p.m.	44	(41.1)	4	(21.1)	11	(78.6)	59	(42.1)
Total	**107**	**(100.0)**	**19**	**(100.0)**	**14**	**(100.0)**	**140**	**(100.0)**
Blood alcohol concentration (g/dL)*								
Zero	61	(67.0)	10	(58.8)	4	(28.6)	75	(61.5)
0.01–0.07	6	(6.6)	1	(5.9)	1	(7.1)	8	(6.6)
≥0.08	24	(26.4)	6	(35.3)	9	(64.3)	39	(32.0)
Total	**91**	**(100.0)**	**17**	**(100.0)**	**14**	**(100.0)**	**122**	**(100.0)**

* A total of 18 deaths among persons aged <16 years or with missing blood alcohol concentration data were excluded. Pedestrians with blood alcohol concentration ≥0.08 g/dL were considered impaired.

What is already known on this topic?

Motor vehicle collisions and crashes are a leading cause of death for Nevada residents aged 5–34 years, representing 14% of all injury deaths in that age group in 2010. In Nevada, collisions with pedestrians accounted for 16% of motor vehicle deaths.

What is added by this report?

Average annual pedestrian death rates in Clark County, Nevada, during 2008–2011 were much higher among homeless persons (30.7 per 100,000 population), compared with residents (1.4) and visitors (1.1). Pedestrian deaths among these groups differed in the prevalence of alcohol involvement and the place and time of collision.

What are the implications for public health practice?

Using coroner's office data to identify pedestrian deaths among homeless persons can help local health authorities identify high-risk geographic locations, times of collisions, and alcohol involvement to support intervention efforts. Because 32.0% of pedestrian deaths in Clark County involved alcohol impairment, interventions to decrease alcohol-impaired walking in areas with concentrations of alcohol-impaired pedestrians might reduce pedestrian deaths.

death rates for visitors and homeless persons might be unstable because of the small numbers of deaths and fluctuations in the two populations. Finally, denominator data for residents are known to include some homeless persons; although an actual count could not be obtained, the number likely is small and unlikely to make a substantial difference in pedestrian death rates for residents.

Higher pedestrian death rates among homeless persons in Clark County might be related to high rates of alcohol and drug abuse, mental illness, and increased time spent walking along roadways (*3*); further research of this population is needed to more fully understand behaviors and environments that increase their risk. Interventions to decrease pedestrian deaths among homeless persons can be enhanced by a deeper understanding of the association between homeless pedestrian deaths and excessive alcohol use, nighttime collisions, and not residing in shelters. Homeless service providers, especially those providing services to unsheltered homeless persons in Clark County, should understand that pedestrian death is a health risk for their clients and consider collaborating with organizations that have expertise in pedestrian safety to identify and implement effective interventions.

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Prevalence of Nodding Syndrome — Uganda, 2012–2013

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Nodding syndrome (NS) is a seizure disorder of unknown etiology, predominately affecting children aged 3–18 years in three sub-Saharan countries (Uganda, South Sudan, and Tanzania), with the primary feature of episodic head nodding. These episodes are thought to be one manifestation of a syndrome that includes neurologic deterioration, cognitive impairment, and additional seizure types. NS investigations have focused on clinical features, progression, and etiology (*1–6*); however, none have provided a population-based prevalence assessment using a standardized case definition. In March 2013, CDC and the Ugandan Ministry of Health (MOH) conducted a single-stage cluster survey to perform the first systematic assessment of prevalence of NS in Uganda using a new consensus case definition (*7*), which was modified during the course of the investigation. Based on the modified definition, the estimated number of probable NS cases in children aged 5–18 years in three northern Uganda districts was 1,687 (95% confidence interval [CI] = 1,463–1,912), for a prevalence of 6.8 (CI = 5.9–7.7) probable NS cases per 1,000 children aged 5–18 years in the three districts. These findings can guide the MOH to understand and provide the health-care resources necessary to address NS in northern Uganda, and provide a basis for future studies of NS in Uganda and in other areas affected by NS.

A sampling frame for the March 2013 assessment was provided by a house-to-house census conducted by village health teams (VHTs) in July 2012 in the northern Ugandan districts of Kitgum, Lamwo, and Pader, where most NS cases have been reported. During the census, VHTs asked the head of household whether anyone in that household has or ever had head nodding; 3,541 persons with reported head nodding were identified. Of these, 3,379 persons were eligible (162 had died) for participation in the 2013 assessment. A standardized questionnaire was used to further classify these cases based on the consensus case definition drafted at the first International Scientific Meeting on Nodding Syndrome in July 2012 (*7*). Respondents were asked about NS symptoms, epilepsy symptoms, development, cognitive functioning, medical history, and family history, and anthropometric measurements were taken. A suspected case was defined as reported head nodding (repetitive involuntary drops of the head towards the chest on two or more occasions) in a previously normal person. A probable case was defined as a suspected case with age of onset at 3–18 years and a frequency of nodding of 5–20 nods per minute, plus at least one of six minor criteria. A confirmed case was defined as a probable case with a documented nodding episode that was either observed and recorded by a trained health-care worker, videotaped, or documented with video electroencephalography or electromyography as atonic seizures (Table 1). The questionnaire was pilot-tested among other persons previously diagnosed with NS, children with epilepsy without head nodding, and healthy children.

To estimate the prevalence of NS, the target sample size was calculated assuming 50% of reported head nodding cases would be classified as probable NS with a CI of ±4.9%, a design effect of 1.5, and 10% nonresponse. With census survey data on number of reported head nodding cases per parish (a parish contains multiple villages), 30 parishes were selected by single-stage cluster sampling with probability proportional to size; 20–30 children with reported head nodding were selected per parish using simple random sampling without replacement. VHTs called selected persons and their caregivers to a central meeting point at a specified date and time. HCWs administered a standardized questionnaire in the local language supervised by CDC and MOH investigators. Results were weighted for unequal probabilities of selection and for nonresponse, and were adjusted for the projected age-sex distribution in the sampling frame. The denominator for the prevalence estimate was calculated using 2012 population projections based on 2002 Uganda Bureau of Statistics census data.

During pilot testing of the questionnaire, caregiver responses to questions about sexual development, a minor criterion in the consensus case definition, were judged unreliable for two main reasons. Caregivers were unable to consistently describe details of physical/sexual development of the children, and study teams were unable to independently verify "normal" versus "delayed" sexual development in the field. Therefore, this criterion was removed from the questionnaire before the assessment (Table 1).

A total of 767 persons with reported head nodding from the census were selected for the 2013 assessment; 23 were ineligible because they moved away, and 19 had died. Of the remaining 725 persons, 178 (24.6%) did not respond (four refused, and 174 were unavailable on the assigned interview date), for a response rate of 75% (547 of 725). Three were excluded from the analysis for incomplete survey responses. The median age

TABLE 1. Consensus case definition and modified consensus case definition for nodding syndrome — Uganda, 2012–2013*

Type of case	Consensus case definition	Modified consensus case definition
Suspected case	Reported head nodding (repetitive involuntary drops of the head towards the chest on two or more occasions) in a previously normal person	Reported head nodding (repetitive involuntary drops of the head towards the chest on two or more occasions) in a previously normal person
Probable case	Suspected case of head nodding, with both major criteria: • Age of onset of nodding ranging from 3 to 18 years • Frequency of nodding 5–20 per minute Plus at least one of the following minor criteria: • Other neurologic abnormalities (cognitive decline, school dropout because of cognitive or behavioral problems, other seizures or neurologic abnormalities) • Clustering in space or time with similar cases • Triggering by food or cold weather • Stunting or wasting • Delayed sexual or physical development • Psychiatric symptoms	Suspected case of head nodding, with one major criterion: • Age of onset of nodding ranging from 3 to 18 years Plus at least one of the following minor criteria: • Other neurologic abnormalities (cognitive decline, school dropout because of cognitive or behavioral problems, other seizures or neurologic abnormalities) • Clustering in space or time with similar cases • Triggering by food or cold weather • Stunting or wasting • Psychiatric symptoms
Confirmed case	Probable case, with documented nodding episode • Observed and recorded by a trained health-care worker, or • Videotaped nodding episode, or • Video/EEG/EMG documenting head nodding as atonic seizures	Probable case, with documented nodding episode • Observed and recorded by a trained health-care worker, or • Videotaped nodding episode, or • Video/EEG/EMG documenting head nodding as atonic seizures

Abbreviations: EEG = electroencephalographic; EMG = electromyographic.

* The consensus case definition was drafted at the first International Scientific Meeting on Nodding Syndrome, held July 30–August 1, 2012, in Kampala, Uganda. Meeting report available at http://www.who.int/neglected_diseases/diseases/Nodding_syndrom_Kampala_Report_2012.pdf. The modified consensus case definition was developed during the March 2013 single-stage cluster survey conducted by CDC and the Ugandan Ministry of Health to assess prevalence of nodding syndrome in Uganda.

of subjects was 13.9 years (range = 1.2–45.2 years); 53% were male. Available caregivers were interviewed for all participants; for 55% the interviewee was the mother, for 17% the father, and for 10% a grandmother.

Of the 544 included study subjects, 385 (71%) were reported to have a current or past history of head nodding. Of these, 325 (84%) were previously normal and therefore met the case definition for suspected NS. Because 121 (31%) gave responses of "don't know" to questions regarding the major criterion of head nodding frequency, data quality was considered to be poor. Consequently, this criterion was dropped, and a modified case definition was used for the analysis. In the modified case definition, a suspected case of NS was the same as in the consensus case definition, but the probable case definition omitted the major criterion of head nodding frequency of 5–20 per minute and the minor criterion of delayed sexual development (Table 1). Of the 325 suspected cases, 300 met the major criterion of age of onset at ages 3–18 years and one minor criterion, and were considered probable cases by the modified case definition. The proportions that met the minor criteria varied, but no case met probable case definition that did not meet the minor criterion of clustering in space and time (Table 2). Of the 300 probable NS cases, 287 (96%) were in persons aged 5–18 years. For all age groups, the number of suspected NS cases was estimated to be 2,019 (CI = 1,758–2,281), with 1,834 (CI = 1,545–2,123) probable NS cases classified using the modified case definition in the three districts (Table 3). Among children aged 5–18 years, the number of suspected NS cases was estimated to be 1,782 (CI = 1,552–2,011), with 1,687 (CI = 1,463–1,912) probable NS cases according to the modified case definition, yielding a prevalence of 7.2 (CI = 6.3–8.1) suspected NS cases per 1,000 population and 6.8 (CI = 5.9–7.7) probable NS cases per 1,000 population in the three districts (Table 2) using the modified case definition.

TABLE 2. Number and percentage of suspected cases of nodding syndrome (N = 325) that met the minor criteria of the modified consensus case definition of a probable case, by selected criteria — Uganda, March 2013

Criteria	No.	(%)*
Major criteria		
Age of onset	300	(91)
Minor criteria		
Other neurologic abnormalities	321	(99)
Clustering in space and time	325	(100)
Triggering by food or cold weather	291	(88)
Stunting or wasting	83	(25)
Psychiatric symptoms	94	(28)

* Weighted percentage.

Discussion

Although an illness similar to NS has been reported in Tanzania since the 1960s, NS was only recently reported in South Sudan and Uganda. In 2009, the Ugandan MOH was notified of reports of possible NS cases in Kitgum District. These reports had apparently been increasing since 2003 (*1*),

TABLE 3. Number of cases and prevalence of nodding syndrome, by age group — Uganda, March 2013

Age group	No. of cases assessed	Estimated no. of cases in all three districts covered	(95% CI)	Prevalence per 1,000 population	(95% CI)
All ages (N = 650,800)	544	3,379		—	
Reported head nodding	385	2,402	(2,152–2,651)	—	
Suspected cases	325	2,019	(1,758–2,281)	—	
Probable cases	300	1,834	(1,545–2,123)	—	
Aged 5–18 yrs (248,243)	489	2,913		—	
Reported head nodding	358	2,131	(1,925–2,338)	—	
Suspected cases	301	1,782	(1,552–2,011)	7.2	(6.3–8.1)
Probable cases	287	1,687	(1,463–1,912)	6.8	(5.9–7.7)

Abbreviation: CI = confidence interval.

What is already known on this topic?

Nodding syndrome (NS) is a seizure disorder of unknown etiology that primarily affects children aged 3–18 years. It has been recognized in the sub-Saharan countries of Uganda, South Sudan, and Tanzania. Most investigations have focused on etiology and clinical progression; however, no population-based assessment of prevalence exists.

What is added by this report?

A consensus case definition was used for the first time to estimate prevalence of NS in northern Uganda. Using the modified consensus case definition developed during this study, the prevalence of probable NS among children aged 5–18 years in three districts in northern Uganda was estimated to be 6.8 cases per 1,000 children.

What are the implications for public health practice?

These results provide the most comprehensive assessment of the burden of NS in the region to date. The modified case definition can also be used in South Sudan and Tanzania to estimate the prevalence of NS in the affected regions of those countries. These data are needed to estimate the health-care resources necessary to support existing NS treatment centers in northern Uganda, and can be used as the basis for studies to establish mortality rates and treatment effectiveness to guide clinical care in other areas affected by NS.

and few had been reported from other districts despite NS being widely publicized.

Studies have demonstrated that NS is a seizure disorder with a sentinel and defining feature of paroxysmal episodes during which the head bobs forward repeatedly because of atonic seizures (*1*). A case series in Uganda demonstrated abnormal electroencephalographic (EEG) and brain magnetic resonance imaging findings in children with NS, confirming that it is a type of epilepsy, and primarily affects children aged 3–18 years (*1*). In South Sudan and Uganda, studies have indicated associations of NS with current or prior infection with the parasitic helminth *Onchocera volvulus* and vitamin B6 deficiency (*4,8*), but the etiology remains unclear. The mortality rate of NS is unknown, but deaths from injury similar to those associated with other forms of epilepsy have been reported (*9*). No proven effective treatment is available, but patients are empirically managed for their seizures with anti-epileptic medications.

The findings in this report are subject to at least four limitations. First, the census used for the sampling frame might have missed cases and resulted in an underestimation of NS prevalence. Second, the classification of NS, similar to epilepsy, relies on caregiver report, because self-report is not reliable and confirmatory techniques such as EEG are not always available (*10*). Such information is subject to misclassification and recall bias, especially when someone other than the primary caregiver is being interviewed. Third, NS questions used in this investigation were modeled on a previously validated epilepsy questionnaire (*10*); however, misclassification might still have resulted in over- or underestimation of NS cases and prevalence. Finally, nonresponse bias might have occurred because respondents were called to a meeting point, which might have excluded persons who were far away or unable to walk.

The prevalence of probable cases of NS was systematically assessed for the first time in the three northern Ugandan districts where most NS cases have been reported, and found to be 6.8 probable NS cases per 1,000 children. This investigation was the first to attempt to use the consensus case definition to determine prevalence (*7*). Modifications were necessary because certain criteria were difficult to assess based on caregiver recall or were not specifically defined. Also, the minor criterion of clustering alone did not clearly differentiate suspected from probable cases in this study population, but might be more useful in combination with other criteria or when used in other populations that have not already been screened. These data can inform future decisions on consensus case definition modifications. These results can also provide a basis for additional studies to establish mortality rates and treatment effectiveness, and for future studies in other areas affected by NS, such as South Sudan and Tanzania. This information is critical for guiding allocation of health-care resources to provide appropriate management of persons with NS in northern Uganda, and for designing a cohesive strategy to address this emerging public health problem in sub-Saharan Africa.

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Notes from the Field

Update: Vitamin B12 Deficiency Among Bhutanese Refugees Resettling in the United States, 2012

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In 2008, clinicians performing routine medical examinations in the United States reported high rates of hematologic and neurologic disorders caused by vitamin B12 deficiency in resettled Bhutanese refugees (*1*). To confirm this finding, CDC screened Bhutanese refugees' serum samples for vitamin B12 levels and found vitamin B12 deficiency in 64% (n = 99) of samples obtained before departure and 27% (n = 64) of samples obtained after arrival in the United States (*1*). In response, CDC recommended that arriving Bhutanese refugees receive oral vitamin B12 supplements and nutrition advice (*1*). In 2012, based on anecdotal reports of decreasing rates of vitamin B12 deficiency in this population, CDC worked with select domestic refugee health programs to determine if the recommendations had reduced the vitamin B12 deficiency rate among Bhutanese refugees.

All refugees who underwent medical screening at the Austin-Travis County clinic in Texas received the previously recommended interventions. Nutrition surveys were administered to measure dietary practices and consumption, overseas and post-arrival, of foods rich in vitamin B12 (e.g., red meat and eggs). The surveys were administered, nutritional counseling was provided, and vitamin B12 serum concentrations were measured pre-intervention and 3 months post-intervention.

A total of 49 Bhutanese refugees aged ≥18 years were included in the assessment. The median age of enrollees was 29 years (range = 17–65 years). Two (4%) were deficient at baseline. The median serum concentration pre-intervention was 344 pg/mL (range = 138–718 pg/mL). Only four (8%) of those screened had any knowledge of vitamin B12.

After intervention, vitamin B12 serum concentrations improved in 47 (58%) of enrollees, all of whom had normal serum concentration levels (normal range = 203–900 pg/mL), and the median serum concentration increased from 344 pg/mL to 402 pg/mL (range = 129–1,746 pg/mL). The two refugees found to be deficient pre-intervention were not deficient post-intervention and had serum concentrations of 276 pg/mL and 260 pg/mL. Two (4%) new cases were detected at follow-up. Improved knowledge of vitamin B12 was demonstrated by 28% of enrollees, and 85% reported consuming more foods rich in vitamin B12. Of the refugees reporting a change in dietary habits post-arrival, 40 (84%) cited improved availability of vitamin B12 rich foods.

Ongoing screening of newly arrived refugees in Minnesota also demonstrated an overall reduction in B12 deficiency post-implementation of the 2011 recommendations. Of 326 Bhutanese refugees screened in Minnesota on arrival, 38% (n = 84) were deficient in 2010, compared with 28% (n = 122) in 2011 and 17% (n=143) in 2012.

Although findings are preliminary, providing nutrition advice and vitamin B12 supplementation to resettled Bhutanese refugees, coupled with improved access to foods rich in vitamin B12, likely resulted in increased vitamin B12 serum concentrations. In addition, the rate of vitamin B12 deficiency might be decreasing among Bhutanese refugees in the refugee camps, possibly because of improved food supply in the camps and increased financial assistance from resettled refugees to those awaiting resettlement. Nonetheless, vitamin B12 deficiency remains high in Bhutanese refugees. CDC recommends that domestic refugee health programs provide Bhutanese refugees with oral vitamin B12 supplements and nutritional advice on arrival (*1*).

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Announcement

Recommendations Regarding Education Programs and Policies to Promote Health Equity — Community Preventive Services Task Force

The Community Preventive Services Task Force posted new information about two recommendations on its website: 1) Promoting Health Equity Through Education Programs and Policies: High School Completion Programs, available at http://www.thecommunityguide.org/healthequity/education/highschoolcompletion.html, and 2) Promoting Health Equity Through Education Programs and Policies: Out-of-School-Time Academic Programs, available at http://www.thecommunityguide.org/healthequity/education/outofschooltime.html.

Established in 1996 by the U.S. Department of Health and Human Services, the task force is an independent, nonfederal, uncompensated panel of public health and prevention experts whose members are appointed by the Director of CDC. The task force provides information for a wide range of decision makers on programs, services, and policies aimed at improving population health. Although CDC provides administrative, research, and technical support for the task force, the recommendations developed are those of the task force and do not undergo review or approval by CDC.

Notice to Readers

Discontinuation of Routine Distribution of Printed Copies of *MMWR Weekly*

Effective August 1, 2014, subscribers who currently receive printed copies of *MMWR* at no cost directly from CDC each week will no longer receive them. This decision was reached after careful consideration of the costs of printing and mailing. Distribution of printed copies of *MMWR* serial publications (i.e., *Recommendations and Reports*, *Surveillance Summaries*, *Supplements*, and *Summaries of Notifiable Diseases*) was discontinued in 2011 (*1*).

All *MMWR* publications are available at no cost online at http://www.cdc.gov/mmwr. Readers desiring to have electronic copies of *MMWR* publications e-mailed to them automatically can subscribe online at http://www.cdc.gov/mmwr/mmwrsubscribe.html. Printed copies of the *MMWR Weekly* and serial publications are available by subscription from the Massachusetts Medical Society and from the U.S. Government Printing Office at http://www.cdc.gov/mmwr/order.html.

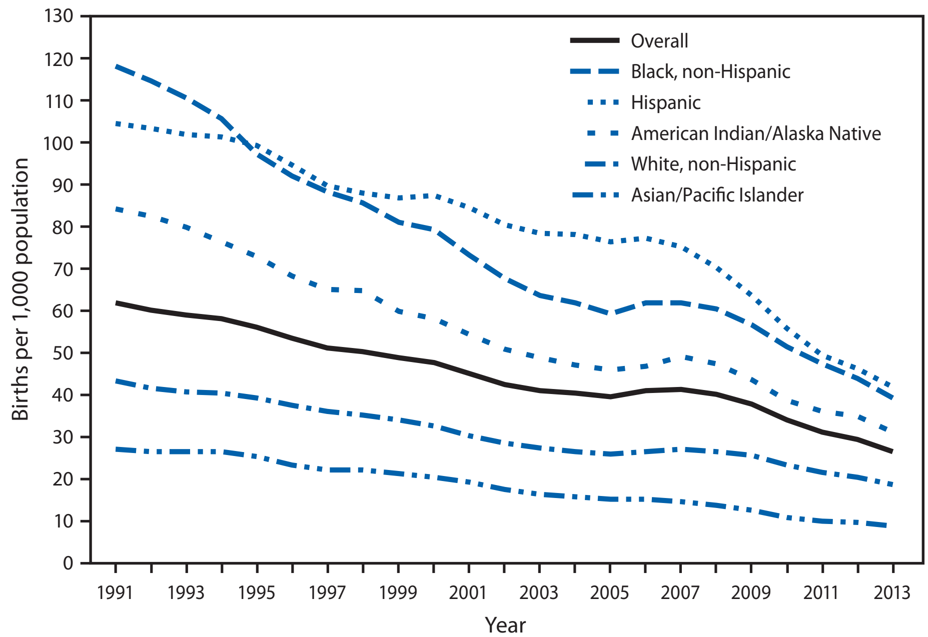
Reference

1. CDC. Notice to readers: discontinuation of routine distribution of printed copies of MMWR serial publications. MMWR 2011;60:993.

QuickStats

FROM THE NATIONAL CENTER FOR HEALTH STATISTICS

Birth Rates for Females Aged 15–19 Years, by Race/Ethnicity* — National Vital Statistics System,† United States, 1991–2013§



* Persons categorized as American Indian/Alaska Native or Asian/Pacific Islander also might be Hispanic. Data for 1991 and 1992 for the categories non-Hispanic black, non-Hispanic white, and Hispanic exclude data from New Hampshire, which did not report Hispanic ethnicity.
† Includes only U.S. residents.
§ Data for 2013 are preliminary.

The overall birth rate for females aged 15–19 years in the United States declined from 61.8 births per 1,000 in 1991 to 26.6 in 2013, a historic low. By racial/ethnic population, rates also declined to historic lows in 2013. Among non-Hispanic black females, the rate declined from 118.2 per 1,000 to 39.2; among Hispanic females, the rate declined from 104.6 to 41.9. Other declines were as follows: American Indians/Alaska Natives, from 84.1 to 31.2; non-Hispanic whites, from 43.4 to 18.7; and Asians/Pacific Islanders, from 27.3 to 8.8.

Source: Hamilton BE, Martin JA, Osterman MJK, Curtin, SC. Births: preliminary data for 2013. Natl Vital Stat Rep 2014;63(2).

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