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Opioid Prescription Claims Among Women of Reproductive Age — United States, 2008–2012

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Prescription opioid use in the United States has become widespread (*1*), and studies of opioid exposure in pregnancy suggest increased risk for adverse pregnancy outcomes, including neonatal abstinence syndrome and birth defects (e.g., neural tube defects, gastroschisis, and congenital heart defects) (*2,3*). The development of birth defects often results from exposures during the first few weeks of pregnancy, which is a critical period for organ formation. Given that many pregnancies are not recognized until well after the first few weeks and half of all U.S. pregnancies are unplanned (*4*), all women who might become pregnant are at risk. Therefore, it is important to assess opioid medication use among all women of reproductive age. CDC used Truven Health's MarketScan Commercial Claims and Encounters and Medicaid data* to estimate the number of opioid prescriptions dispensed by outpatient pharmacies to women aged 15–44 years. During 2008–2012, opioid prescription claims were consistently higher among Medicaid-enrolled women when compared with privately insured women (39.4% compared with 27.7%, p<0.001). The most frequently prescribed opioids among women in both groups were hydrocodone, codeine, and oxycodone. Efforts are needed to promote interventions to reduce opioid prescriptions among this population when safer alternative treatments are available.

CDC used Truven Health's MarketScan Commercial Claims and Encounters and Medicaid data from 2008–2012 to assess outpatient pharmacy prescription drug claims for opioid-containing medications among reproductive-aged women (15–44 years). The Commercial Claims and Encounters data represent a convenience sample of employed persons with private employer–sponsored insurance and their dependents. The Medicaid data are an annual sample of Medicaid recipients in 10–13 states across the United States. Both data sources include person-level information (e.g., age, sex, and enrollment period) and claim-level data (e.g., outpatient pharmacy prescription claims). This analysis was restricted to women continuously enrolled (≥365 days) for the year under study in a private insurance or Medicaid plan that included prescription drug coverage. Outpatient pharmacy prescription medication claims were searched for opioid-containing medications using national drug codes; pure opioid antagonists (e.g., naloxone), medications that block the effects of opioids, were excluded when not combined with an opioid (e.g., buprenorphine/naloxone). For each woman, the prescription claims data were analyzed to determine whether she had ever filled a prescription for an opioid medication from an outpatient pharmacy during a given calendar year. The annual proportion of reproductive-aged women with outpatient prescription claims for an opioid during 2008–2012 was examined by health care coverage type and specific opioid medication, age group, U.S. geographic region (only available for privately insured women), and race/

* Proprietary data on inpatient services and outpatient services and pharmacy claims provided by a convenience sample of commercial insurance providers and a sample of states (for Medicaid claims). Additional information is available at http://truvenhealth.com.

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ethnicity (only available for Medicaid-enrolled women). The average proportion of reproductive-aged women who filled a prescription for an opioid from an outpatient pharmacy each year was also estimated. Chi-square tests were used to determine whether significant differences existed between the frequency of opioid claims among privately insured and Medicaid-enrolled women.

There were approximately 4.4–6.6 million privately insured and 0.4–0.8 million Medicaid-enrolled reproductive-aged women in the study sample each year during 2008–2012. Of these, on average 27.7% of privately insured and 39.4% of Medicaid-enrolled women filled a prescription for an opioid from an outpatient pharmacy each year ($p<0.001$). Opioid prescription claims were highest in 2009 with 29.1% of privately insured women and 41.4% of Medicaid-enrolled women filling a prescription for an opioid. During 2008–2012, opioid prescription claims were consistently higher among Medicaid-enrolled women when compared with privately insured women (Figure 1). In 2012, there were 0.7 and 1.6 prescriptions filled per woman among privately insured and Medicaid-enrolled women, respectively; of those who filled an opioid prescription, an average of 2.6 and 4.3 prescriptions were filled, respectively (Figure 2).

The most commonly prescribed opioids during 2008–2012 were hydrocodone (reported by an average of 17.5% of privately insured and 25.0% of Medicaid-enrolled women each year), codeine (6.9% and 9.4%), and oxycodone (5.5% and 13.0%) (Table). Privately insured women aged 30–34 years and Medicaid-enrolled women aged 40–44 years were most likely to fill prescriptions for opioids (Table). Among women with either type of health care coverage, women aged 15–19 years were least likely to fill a prescription for an opioid. Overall, for all age groups, women with Medicaid filled prescriptions for opioids more frequently than women with private insurance.

Significant regional and racial/ethnic differences were observed. Among privately insured women, opioid prescription claims were highest among those residing in the South. Among Medicaid-enrolled women, opioid prescription claims were highest among non-Hispanic whites ($p<0.001$) (Table).

Discussion

Opioid-containing medications are widely prescribed among reproductive-aged women with either private insurance or Medicaid, with approximately one fourth of privately insured and over one third of Medicaid-enrolled women filling a prescription for an opioid each year during 2008–2012. In addition, CDC found an average of three opioids prescribed for every four privately insured women and nearly two opioid prescriptions for every one Medicaid-enrolled woman per year. This is a significant public health concern given evidence of adverse pregnancy outcomes with opioid exposure, the likelihood of exposures occurring among unrecognized or unintended pregnancies, and health care provider concerns about using other pain medications during early pregnancy (*2,4,5*).

This analysis presents data among all reproductive-aged women; however, previous studies from slightly earlier time

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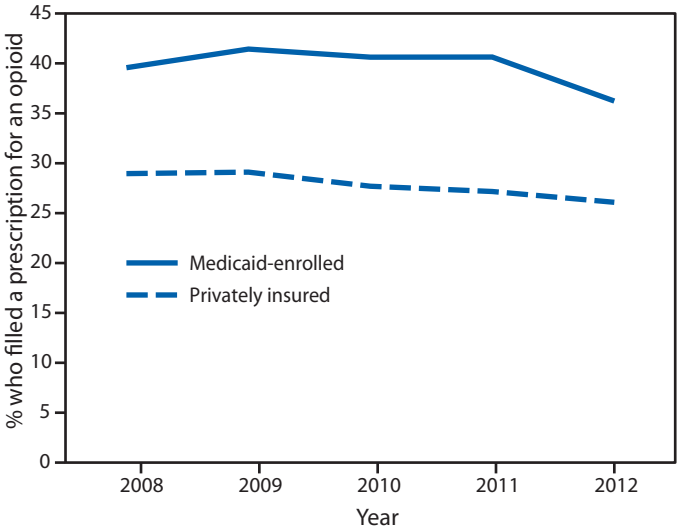
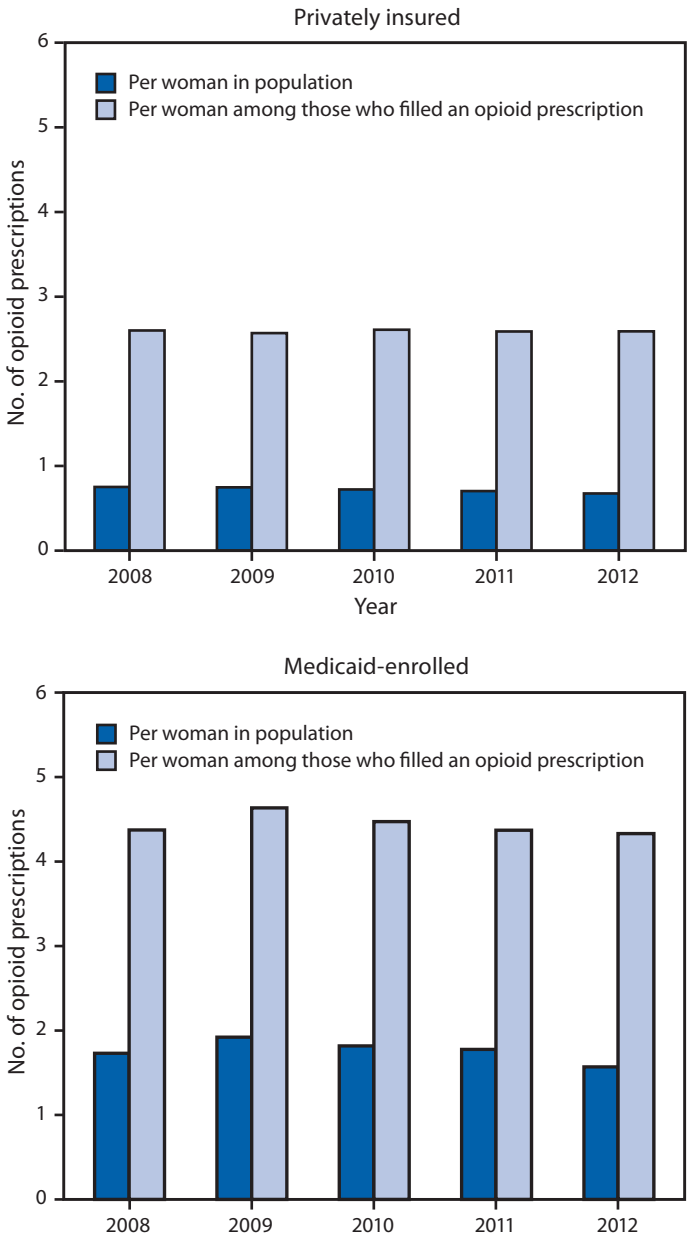
FIGURE 1. Percentage of women aged 15–44 years who filled a prescription for an opioid from an outpatient pharmacy, by health care coverage type and year — United States, 2008–2012



Source: Truven Health's MarketScan Commercial Claims and Encounters and Medicaid data.

FIGURE 2. Average number of opioid prescriptions filled at an outpatient pharmacy per woman aged 15–44 years, among women with private insurance and Medicaid — United States, 2008–2012



Source: Truven Health's MarketScan Commercial Claims and Encounters and Medicaid data.

periods have reported data among women who were actually pregnant. In general, more reproductive-aged women filled a prescription for an opioid in this study compared with what has been found among pregnant women. In a study of approximately 534,000 pregnant women with private insurance during 2005–2011, 14.4% filled a prescription for an opioid during pregnancy (*6*). In a study of approximately 1.1 million Medicaid-enrolled women nationwide with pregnancies during 2000–2007, 21.6% filled a prescription for an opioid from an outpatient pharmacy during pregnancy (*7*), and opioid dispensing increased over time. Similar to the findings in this report, these two previous studies of pregnant women also reported hydrocodone, codeine, and oxycodone as among the opioids most commonly dispensed by outpatient pharmacies.

The consistently higher frequency of opioid prescribing to Medicaid-enrolled women is of concern because approximately 50% of U.S. births occur to Medicaid-enrolled women (*8*). Other studies have found higher opioid prescribing rates to Medicaid-enrolled populations as compared with privately insured populations, but these have not specifically assessed use in reproductive-aged women. One study showed that, in 2005, 17% of a sample of persons aged ≥18 years enrolled in a multistate private insurance plan received an opioid prescription, compared with 30% of those enrolled in Arkansas Medicaid (*9*). These differences by health care coverage type might reflect differences in health plan drug formularies, differences in patient use of health care services based on health care coverage, or differences in the prevalence of underlying health conditions among Medicaid recipients compared with persons covered by employer-provided private health insurance.

Geographic region was available for the privately insured claims data and showed opioid prescription rates were highest among reproductive-aged women residing in the South and lowest in the Northeast. Race/ethnicity was available for Medicaid data, and indicated opioid prescriptions were nearly 1.5 times higher among non-Hispanic white reproductive-aged

TABLE. Percentage of women aged 15–44 years who filled a prescription for an opioid from an outpatient pharmacy, by health care coverage type and year — United States, 2008–2012

	Privately insured						Medicaid-enrolled					
Characteristic	2008	2009	2010	2011	2012	Average 2008–2012*	2008	2009	2010	2011	2012	Average 2008–2012*
Total women†	**4,440,181**	**5,225,282**	**5,635,375**	**6,417,512**	**6,598,518**		**422,602**	**552,425**	**568,802**	**534,976**	**803,920**	
Age group (yrs)												
15–19	21.2	22.0	20.2	20.1	19.3	**20.4**	25.3	26.9	26.8	26.1	24.6	**25.9**
20–24	25.8	26.2	23.9	23.1	22.0	**23.8**	41.6	44.5	43.5	43.0	37.8	**41.7**
25–29	31.2	31.1	29.7	29.1	27.6	**29.6**	46.5	50.0	48.6	48.3	41.9	**46.6**
30–34	32.1	31.9	30.8	30.7	29.7	**30.9**	47.8	51.8	50.5	50.6	44.9	**48.7**
35–39	31.4	31.4	30.3	30.0	29.2	**30.4**	50.0	53.1	52.1	53.4	46.4	**50.6**
40–44	31.0	30.8	29.9	29.6	28.8	**29.9**	52.5	54.4	53.6	56.4	48.0	**52.5**
Geographic region§												
Northeast	22.6	22.4	21.5	22.0	21.0	**21.8**						
North central	26.6	26.6	25.2	25.1	23.9	**25.4**						
South	32.2	32.7	31.8	30.7	30.4	**31.5**						
West	27.8	28.5	26.8	26.4	24.6	**26.6**						
Unknown	24.4	23.5	22.1	28.9	27.6	**27.3**						
Race/Ethnicity¶												
White, non-Hispanic							49.2	49.7	48.1	45.7	42.1	**46.4**
Black, non-Hispanic							35.5	38.5	38.0	35.7	31.0	**35.2**
Hispanic							39.3	37.7	34.9	33.4	26.0	**33.6**
Other race							22.0	26.5	22.3	37.1	34.6	**28.0**
Specific opioids**												
Hydrocodone	18.0	17.8	17.3	17.6	16.9	**17.5**	22.9	25.1	26.4	27.0	23.9	**25.0**
Codeine	7.2	7.9	6.8	6.8	6.2	**6.9**	10.9	11.7	9.6	9.1	7.1	**9.4**
Oxycodone	5.2	5.4	5.6	5.7	5.5	**5.5**	13.2	13.4	12.7	13.4	12.5	**13.0**
Tramadol	2.4	2.5	2.7	3.3	3.4	**2.9**	6.8	7.9	8.5	9.7	8.9	**8.5**
Propoxyphene††	3.9	3.3	2.7	—	—	**1.8**	6.8	6.4	5.4	—	—	**3.3**
Hydromorphone	0.2	0.3	0.3	0.3	0.3	**0.3**	0.6	0.7	1.1	1.2	0.9	**0.9**
Meperidine	0.5	0.3	0.2	0.2	0.2	**0.3**	0.6	0.4	0.3	0.3	0.2	**0.3**
Morphine	0.2	0.1	0.1	0.1	0.1	**0.1**	0.8	0.6	0.6	0.5	0.5	**0.6**
Buprenorphine	0.1	0.1	0.1	0.2	0.2	**0.1**	0.2	0.3	0.3	0.4	0.5	**0.3**
Fentanyl	0.1	0.1	0.1	0.1	0.1	**0.1**	1.0	1.1	1.6	1.7	1.2	**1.3**
Tapentadol	0.0	0.0	0.1	0.2	0.2	**0.1**	0.0	0.0	0.1	0.0	0.1	**0.1**
Dihydrocodeine	0.1	0.1	0.1	0.1	0.0	**0.1**	0.1	0.1	0.1	0.0	0.0	**0.1**
Methadone	0.1	0.1	0.1	0.1	0.0	**0.1**	0.2	0.2	0.2	0.2	0.2	**0.2**

Source: Truven Health's MarketScan Commercial Claims and Encounters and Medicaid data.
* The same woman might have been included in multiple years of data.
† Continuously enrolled (member days ≥365) in a plan that includes prescription drug coverage.
§ Geographic region is not included in Truven Health's Medicaid data.
¶ Race/ethnicity is not included in Truven Health's Commercial Claims and Encounters data.
** Not mutually exclusive; among prescriptions filled by at least 0.1% of privately insured or Medicaid-enrolled women on average each year during 2008–2012.
†† Discontinued after 2010.

women than among non-Hispanic black or Hispanic women. Other reports of opioid prescribing patterns have shown similar geographic trends, with the South having the greatest number of prescription opioid claims (*1,6,7*), and white women being more likely than women of other racial/ethnic populations to fill an opioid prescription (*7*).

Although there appeared to be a decline in the frequency of opioids prescribed to both privately insured and Medicaid-enrolled women of reproductive age from 2009 to 2012, any conclusions about changes over time must be interpreted with caution. The apparent decline might indicate improvements in opioid prescribing practices; however, given the potential changes in the composition of the sample used for the privately insured claims data and in the states included in the Medicaid sample each year, this conclusion cannot be drawn from these data. At least one study has noted a decrease in opioid prescriptions among pregnant women, with a decline from 14.9% in 2005 to 12.9% in 2011 (*6*), although studies focused on earlier time periods have not noted such a decline (*7,9*). Notably, recently implemented federal regulation of certain opioid medications, such as hydrocodone, might decrease use in these populations (*10*).

The findings in this report are subject to at least four limitations. First, Truven Health's MarketScan Commercial Claims and Encounters and Medicaid data are samples and might not be generalizable to the entire U.S. population. Although

What is already known on this topic?

Opioid use among women of reproductive age is a concern because opioid medications have been linked to birth defects and other adverse pregnancy outcomes. Given the high rate (approximately 50%) of unintended pregnancies in the United States, opioid use among reproductive-aged women can result in many early pregnancy exposures.

What is added by this report?

During 2008–2012, more than one fourth of privately insured and more than one third of Medicaid-enrolled reproductive-aged women (15–44 years) filled a prescription for an opioid from an outpatient pharmacy each year. Prescription rates were consistently higher among Medicaid-enrolled women when compared with privately insured women.

What are the implications for public health practice?

More targeted interventions and communications strategies are needed to reduce unnecessary prescribing and use of opioid-containing medications, particularly among women who might become pregnant.

the privately insured claims data represent approximately 4–6 million insured persons, it is likely that they are only representative of persons with employer-based private insurance. The 10–13 states that contribute their data to the Medicaid sample each year do so anonymously. Therefore, changes over time in the Medicaid data might reflect changes in the sample of states, instead of broader changes among the Medicaid-enrolled population. It is also likely that certain women will be included in multiple years of either the Commercial Claims and Encounters or Medicaid data. Second, pregnant women were not identified in this analysis; the study population was based on female sex and age 15–44 years alone. Whether opioid prescriptions were limited to infertile or contracepting women was not ascertained. Third, these analyses likely underestimate opioid use, because the data only represent outpatient pharmacy claims. No information on inpatient opioid use, opioids obtained without a prescription, or opioids paid for out-of-pocket was available. Finally, although these data represent opioids dispensed by outpatient pharmacies, there was no verification that women actually took the medications.

This analysis used a large database to estimate the proportion of privately insured and Medicaid-enrolled reproductive-aged women who filled a prescription for an opioid from an outpatient pharmacy. Many women need to take opioid-containing medications to appropriately manage their health conditions; however, in some instances safer alternative treatments are available and use of opioids is unnecessary. Having a better understanding of prescription opioid use just before and during early pregnancy can help inform targeted interventions to reduce unnecessary prescribing of opioids and provide evidence-based information to health care providers and women about the risks of prenatal opioid exposure.

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Worker Illness Related to Newly Marketed Pesticides — Douglas County, Washington, 2014

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On April 10, 2014 the Washington State Department of Agriculture (WSDA) was notified by a local newspaper of a suspected pesticide poisoning incident in Douglas County involving pesticides not previously reported in the published literature to be associated with human illness. On that same day, WSDA notified the Washington State Department of Health, which investigated this incident by conducting a site visit, reviewing medical and applicator records, and interviewing affected farmworkers, pesticide applicators, and the farmworkers' employer. In addition, on April 11, WSDA collected swab, foliage, and clothing samples and tested them for residues of pyridaben,* novaluron,† and triflumizole.§ In this incident, all 20 farmworkers working in a cherry orchard became ill from off-target drift of a pesticide mixture that was being applied to a neighboring pear orchard. Sixteen sought medical treatment for neurologic, gastrointestinal, ocular, and respiratory symptoms. This event highlights the need for greater efforts to prevent off-target drift exposures and promote awareness about the toxicity of some recently marketed pesticides. Incidents such as this could be prevented if farm managers planning pesticide applications notify their neighbors of their plans.

On April 8, 2014, two pesticide applicators were driving tractor-pulled airblast sprayers to apply a mixture of pesticides to prevent psylla infestations in a pear orchard.¶ At about 1:30 pm the tractors approached the end of the orchard, which abuts a cherry orchard. In the cherry orchard, 20 Hispanic farmworkers (19 women and one man) were tying the branches of cherry trees to trellises to improve fruit yields. Median age of the farmworkers was 33 years (range: 25–63 years). The workers were dispersed, and their distance from the edge of the pear orchard ranged from 30 to >350 feet (9 to >107 meters). The farmworkers and applicators disagree regarding when the applicators first observed the farmworkers and when the application ceased. The pesticide mixture included novaluron, pyridaben, and triflumizole, along with mineral oil,** boron (a micronutrient), and phosphoric acid (an acidifier, defoaming agent, and fertilizer).†† The farmworkers had not been notified of the pear orchard pesticide application before starting work in the cherry orchard.

All 20 cherry orchard workers reported that they began feeling ill within minutes of exposure to the drifting pesticides. The crew leader called 9-1-1. All of the workers reported two or more symptoms consistent with those caused by the pesticides applied to the pear orchard (*1*). Emergency medical services personnel decontaminated five workers at the orchard and transported them to an emergency department, where they were treated for their symptoms. A total of 16 workers eventually sought medical care. Six workers had moderate-severity illness, and the remaining 14 workers had low-severity illness.§§ The most commonly reported symptoms were neurologic (100%) (e.g., headache and paresthesias), gastrointestinal (95%)(e.g., nausea), ocular (85%)(e.g., eye pain/irritation), and respiratory (80%)(e.g., upper respiratory irritation and dyspnea) (Table). Of the eight workers who were contacted at least 2 weeks after the incident, six (75%) had symptoms that persisted for at least 2 weeks. The two applicators were wearing complete personal protective equipment (including air-purifying respirators and chemical-resistant headgear) and reported no symptoms.

Several of the samples collected by WSDA for pesticide residue analysis tested positive, including two clothing samples from farmworkers that tested positive for triflumizole. Both of these workers were working within 50 feet (15 meters) of the pesticide application. Residues of all three pesticides were found on cherry foliage. Residues of novaluron and pyridaben were found on the portable toilet used by the farmworkers (located at the boundary between the two orchards) and on the grass in the cherry orchard.

* Nexter miticide/insecticide; Gowan Company; U.S. Environmental Protection Agency (EPA) registration number 81880-4-10163. EPA toxicity category II. The toxicity of a pesticide is determined by EPA under guidance available from the Code of Federal Regulations 40 CFR 156.208(c)(2)(iii). Pesticides in category I are the most acutely toxic, and pesticides in category IV are the least.

† Rimon 0.83 EC insecticide; Makhteshim Agan of North America, Inc. EPA registration number 66222-35. EPA toxicity category II.

§ Procure 480SC agricultural fungicide; Chemtura Corporation. EPA registration number 400-518. EPA toxicity category III.

¶ Psylla is a major pear insect pest in North America. Additional information available at http://www.ipm.ucdavis.edu/pmg/r603301111.html.

** Hi Supreme spray oil; Independent Agribusiness Professionals. EPA registration number 71058-2. EPA toxicity category III. This was used as an insecticide.

†† Buffer-Ten; Monterey AgResources. California registration number 17545-50016. EPA toxicity category I.

§§ Standardized coding was used to determine severity of illness (information available at http://www.cdc.gov/niosh/topics/pesticides/pdfs/pest-sevindexv6.pdf). Low-severity cases usually resolve without treatment and cause minimal time lost from work or normal activities (<3 days). Moderate-severity cases are not life-threatening but require medical treatment and result in <6 days lost from work or normal activities.

TABLE. Signs and symptoms reported by 20 farmworkers exposed during a pesticide application — Douglas County, Washington, April 2014

Sign/Symptom*	No.	(%)
Neurologic	**20**	**(100)**
Headache	18	(90)
Paresthesias	14	(70)
Dizziness	12	(60)
Altered taste	10	(50)
Other†	6	(30)
Gastrointestinal	**19**	**(95)**
Nausea	15	(75)
Vomiting	10	(50)
Abdominal pain	9	(45)
Anorexia	3	(15)
Eye	**18**	**(90)**
Eye pain/irritation	16	(80)
Lacrimation	5	(25)
Conjunctivitis	3	(15)
Respiratory	**16**	**(80)**
Upper respiratory irritation	12	(60)
Dyspnea	10	(50)
Cough	4	(20)
Asthma exacerbation	2	(10)
Dermatologic§	**5**	**(25)**
Cardiovascular¶	**2**	**(10)**

* The total number of signs/symptoms exceeds 20 because many persons had more than one sign or symptom.
† Other includes fatigue (one person), blurred vision (one), anxiety (one), fasciculations (one), and weakness (three).
§ Includes pruritis (four persons), rash (three), and redness (one).
¶ Includes elevated blood pressure (one person), palpitations (one).

WSDA obtained wind speed and direction data from applicator and meteorologic records. Wind speed, measured hours before the incident by the applicators at the pear orchard using a handheld anemometer and documented in the application record, was low at 0–4 mph (0–6 kph), but the wind direction was variable. When the application began at 7:00 am, the wind direction was away from the cherry orchard, but at the time of the incident the winds were blowing in a circular pattern up to 18 mph (29 kph), and this is thought to have contributed to the incident.

Discussion

This report highlights at least three potential occupational hazards in agriculture: off-target pesticide drift, toxicity of some recently marketed pesticides, and a gap in worker notification requirements. In this incident, off-target drift of a pesticide mixture was determined to be the cause of symptoms in 20 farmworkers. This finding is substantiated by the short distance between the site of pesticide application and the farmworkers location; the detection of pesticide residues on samples collected in the cherry orchard and on the worker's clothing; the sudden onset of symptoms coinciding with the application; and symptoms that were consistent with those caused by the pesticides applied to the pear orchard. Off-target drift has previously been documented as the most common root cause of acute pesticide-related illness among farmworkers (*2*).

In the spring, pesticides are often applied to pear trees to prevent psylla infestations. Psylla can accumulate on leaves and fruit, reducing the plant's photosynthetic capacity and producing deformed fruit with reduced commercial value. Because pests develop resistance to pesticides, there is a continual need to develop novel pesticides that attack different pest vulnerabilities. This is the first published report of illnesses associated with exposure to three recently introduced pesticides: pyridaben, novaluron, and triflumizole. The products applied to the pear orchard that contained pyridaben and novaluron were both toxicity category II pesticide products. Pyridaben is an insecticide and miticide that acts by inhibiting mitochondrial complex I electron transport. It was first approved to be sold in the United States in 1994. The product label for pyridaben warns that it can be fatal if inhaled and that pesticide applicators and handlers are required to use extensive personal protective equipment, including air-purifying respirators (*3*). It also can cause moderate eye irritation. Novaluron is an insect growth regulator that acts by inhibiting chitin synthesis. It was initially registered for sale in the United States in 2001. It is reported to cause substantial but temporary eye injury (*4*). Triflumizole is an imidazole fungicide that was first sold in liquid form in 2007. It is a toxicity category III product, is considered to have low mammalian toxicity but is irritating to the eyes and gastrointestinal tract, and might cause allergic skin reactions (*5*). No peer-reviewed in-vivo studies are available on triflumizole (*6*). Phosphoric acid is a toxicity category I product which, in pure form, can cause irreversible eye damage and skin burns. However, it is not likely to be responsible for illness because it is often used to achieve a neutral pH in pesticide mixtures. The pesticide mixture that the farmworkers were exposed to also contained mineral oil and boron, but these have low toxicity and are not thought to have contributed to illness onset.

The findings in this report are subject to at least three limitations. First, these workers were exposed to a mixture of several pesticides. It was not possible to determine if one active ingredient was responsible for the illnesses or if several were acting in concert. Second, symptoms of acute illnesses associated with pesticides are nonspecific and not pathognomonic, and diagnostic tests are not available to measure blood or urine levels of the pesticides involved in this event. Therefore false-positives might have been included as cases. Finally, samples for residue analysis were collected ≥3 days after the event. If the samples had been collected closer to the time of the event, more samples might have tested positive.

This event might have been prevented through better communication between managers of the cherry and pear orchards.

Currently, only workers employed on the farm where the application is occurring must be notified about a pesticide application (Code of Federal Regulations (CFR) Title 40 Part 170.122). There is no Washington state or federal requirement to provide notification about pesticide applications to workers on a neighboring farm. There was anecdotal evidence to suggest that in the past, the managers of the two orchards involved in this event routinely and voluntarily shared information on upcoming pesticide applications to prevent pesticide exposures among workers in the neighboring orchard (Matt West, WSDA; personal communication; July 22, 2014). However, no such notification occurred in April 2014, possibly because both orchards experienced a recent turnover in management staff. Such a lack of notification to a neighboring farm is a frequent contributing factor to acute pesticide-related illness. Washington State Department of Health found that 31% of all acute pesticide-related illness cases identified among farmworkers during 2005–2012 involved exposure to off-target drift of pesticides that were applied to a neighboring farm (Joanne Prado, Washington State Department of Health; personal communication; August 18, 2014). In addition, a previous report documented lack of notification to a neighboring farm as a contributing factor in a cluster of acute pesticide-related illnesses in 2005 (*7*). At least one state health department (the California Department of Health Services) recommends that workers in nearby areas should be notified about scheduled pesticide applications, even when not required (*7*). Furthermore, although regulations prohibit applying agricultural pesticides in a manner that results in contact with workers or other persons (CFR Title 40 Part 170.210), the regulations do not explicitly state that applications must cease when the applicator observes workers or bystanders in neighboring, nontarget areas.

Acknowledgment

Matt West, Washington State Department of Agriculture.

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What is already known on this topic?

Off-target drift is the most common root cause for acute pesticide-related illness among farmworkers. Before an agricultural pesticide application is made, federal regulations require that workers employed on the farm where the application will be made be notified of the application. However, there is no requirement to notify the workers on adjacent farms of a pesticide application.

What is added by this report?

An off-target pesticide drift event occurred in April 2014, when pesticides applied to a pear orchard drifted over to a neighboring cherry orchard and quickly sickened all 20 farmworkers working in the cherry orchard. The vast majority reported neurologic, gastrointestinal, ocular, and respiratory symptoms. Six workers had moderate-severity illness, and the remaining 14 workers had low-severity illness. There are no previous reports in the literature of human illness caused by the three pesticides involved in this event (pyridaben, novaluron, and triflumizole).

What are the implications for public health practice?

This report highlights three potential occupational hazards in agriculture: off-target pesticide drift, toxicity of some recently marketed pesticides, and a gap in worker notification requirements. Incidents such as this could be prevented if farm managers planning pesticide applications notify their neighbors of their plans.

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Notes from the Field

Investigation of Contacts of a Health Care Worker Who Worked While Ill with Pertussis — Maryland, August–September 2014

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On September 5, 2014, the public health department of a Maryland hospital was notified of a case of *Bordetella pertussis* infection confirmed by polymerase chain reaction (PCR) in a staff health care worker (HCW). The HCW experienced onset of diarrhea and malaise (nonrespiratory symptoms atypical of the catarrhal phase of pertussis) on August 26. By September 2, paroxysms of coughing led the HCW to consult a colleague, who ordered the PCR test, prescribed a 5-day course of azithromycin, and advised avoidance of patient care until treatment completion. Contrary to the hospital's infection control policy, neither the HCW nor the colleague reported the presumptive diagnosis of pertussis to the hospital's public health department. The HCW continued to work in the outpatient department until the positive PCR result was received on September 5, at which time the hospital's public health department was first notified. The hospital barred the HCW from further work at the hospital while ill, and, in collaboration with local and state public health counterparts, began a contact investigation and stratified patient and HCW contacts by level of exposure.

The HCW had received tetanus, diphtheria, and acellular pertussis vaccine (Tdap) in 2010 and reported an ill family member who had been exposed at school during a widespread outbreak of pertussis affecting the surrounding community in August (*1*). In all, 47 persons were identified as being exposed to the HCW, including 31 patients ranging in age from 7 days to 12 years (six of whom were too young to receive diphtheria, tetanus, and acellular pertussis vaccine [DTaP]) and 15 HCWs. Of these exposed persons, 22 were considered high-risk contacts (seven patients and 15 HCWs) because they were aged <12 months, or contacts who themselves have close contact with infants under 12 months, pregnant women, or persons with preexisting health conditions at risk for severe illness or complications from pertussis. All 22 high-risk contacts were assessed for symptoms and received postexposure prophylaxis according to established guidelines (*2*). Additionally, six HCW high-risk contacts (three staff physicians, two residents, and one nurse) reported symptoms suggestive of pertussis and were excluded from work until completion of a course of antibiotics. No patient contacts reported symptoms. Nasopharyngeal swabs obtained from all symptomatic high-risk contacts were negative for pertussis by PCR. The remaining low-risk contacts, or their identified parents or guardians, were screened for symptoms, informed of the low-risk nature of the exposure, and provided education on the signs and symptoms of pertussis. All 47 persons identified as exposed were contacted by public health investigators.

HCW presenteeism (i.e., working while sick) can jeopardize the well-being of patients and coworkers (*3*). Because of the need to investigate and limit exposures, clinical activities in a facility can be disrupted when staff members are potentially exposed to transmissible disease. HCWs should not work while ill with a potentially contagious condition.

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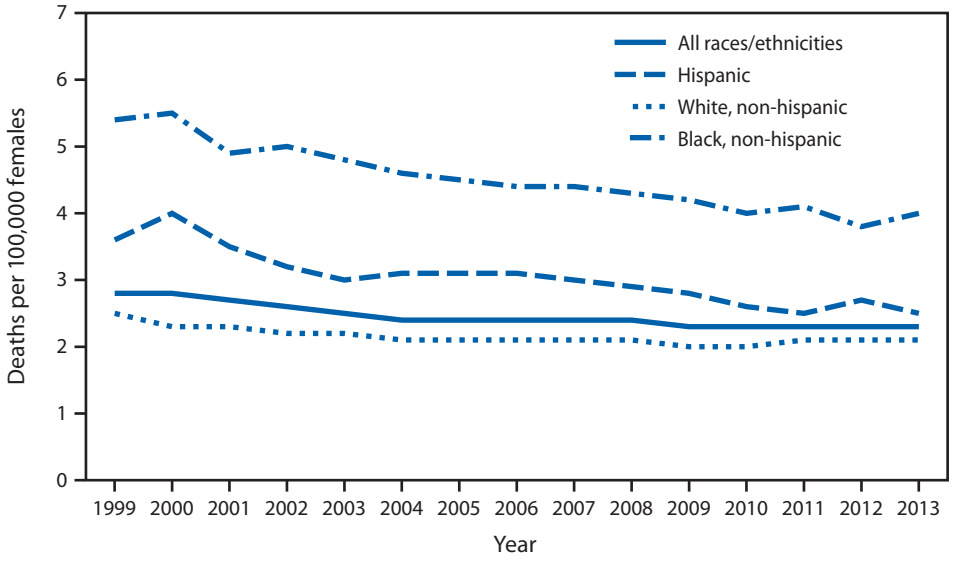
QuickStats

FROM THE NATIONAL CENTER FOR HEALTH STATISTICS

Death Rates* for Cervical Cancer† — National Vital Statistics System, United States, 1999–2013



* Age-adjusted rates (deaths per 100,000) based on the 2000 U.S. standard population. Populations used for computing death rates for 2011–2013 are postcensal estimates based on the 2010 census, estimated as of July 1, 2013. Rates for census years are based on populations enumerated in the corresponding censuses. Rates for noncensus years before 2010 are revised using updated intercensal population estimates and might differ from rates previously published.

† Malignant neoplasm of cervix uteri (*International Classification of Diseases, 10th Revision* [ICD-10] code C53) as the underlying cause of death includes the following ICD-10 codes: endocervix (C53.0), exocervix (C53.1), overlapping lesion of cervix uteri (C53.8), and cervix uteri, unspecified (C53.9).

In 2013, the age-adjusted cervical cancer death rate was 2.3 per 100,000. The rate for non-Hispanic black females was nearly double the rate for non-Hispanic white females (4.0 compared to 2.1) and 1.6 higher than the rate of 2.5 for Hispanic females. From 1999 to 2013, cervical cancer death rates have decreased 31% for Hispanic females, 26% for non-Hispanic black females, and 16% for non-Hispanic white females.

Source: National Vital Statistics System. Mortality public use data files, 2013. Available at http://www.cdc.gov/nchs/data_access/vitalstatsonline.htm.

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