

## DIABETES MELLITUS; TYPE I & II

*Does Not Include Secondary Diabetes (Diabetes Due to an Underlying Condition) or Other Specified Diabetes Mellitus*

### **Background**

This case definition was developed by the Armed Forces Health Surveillance Branch (AFHSB) for the purpose of epidemiological surveillance of a condition important to military-associated populations.

### **Clinical Description**

Diabetes mellitus (DM) refers to a group of common metabolic disorders that share the characteristic of abnormally high levels of glucose in the blood (hyperglycemia). Factors contributing to the hyperglycemia include insufficient insulin secretion by the pancreas, decreased glucose utilization, increased glucose production, and insulin resistance. The metabolic effects associated with DM cause changes in multiple organ systems that impose a tremendous burden on the individual with diabetes and on the health care system.<sup>1</sup>

### **Case Definition and Incidence Rules**

For surveillance purposes, a case of diabetes mellitus is defined as:

- *Two or more medical encounters, hospitalizations or outpatient, occurring within 90 days of each other, with any of the case defining diagnoses of type I or type II diabetes mellitus (see ICD9 and ICD10 code lists below) in the primary diagnostic position.*
- For the purposes of this case definition, individuals are classified as type 1 or type 2 cases based on the diagnoses reported in the two case defining encounters. If both a type 1 and type 2 diabetes diagnoses are reported during an individual's two case defining medical encounters, they are classified as unspecified.

#### ***Incidence rules:***

For individuals who meet the case definition:

- The incidence date is considered the date of the first hospitalization or outpatient medical encounter that includes a diagnosis of diabetes mellitus.
- An individual is considered an incident case only *once per lifetime*.

#### ***Exclusions:***

- Females with ICD10 code O24.4- (gestational diabetes mellitus)

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<sup>1</sup> Braunwald, E., Fauci, A., Longo, D. et al. 2008. *Harrison's Principles of Internal Medicine*. 17<sup>th</sup> ed. United States: McGraw-Hill Professional.



### Case Definition and Incidence Rules (continued)

- Females with a hospitalization for labor and delivery indicated by one or more of the following codes in *any* diagnostic position *within 6 months* after their incident diabetes diagnosis. Such individuals can be counted as incident cases if *at least* 6 months have passed since their pregnancy ended unless they again become pregnant and again qualify for the exclusion.
  - ICD9 650-659 (normal delivery, and other indications for care in pregnancy, labor, and delivery), ICD9 660-669 (complications occurring mainly in the course of labor and delivery) and V27 (outcome of delivery).
  - ICD10 codes O60-077 (complications of labor and delivery), 080-082 (encounter for delivery) and Z37 (outcome of delivery)

### Codes

The following ICD9 and ICD10 codes are included in the case definition:

Condition	ICD-10-CM Codes	ICD-9-CM Codes
Diabetes mellitus <i>(Type I)</i>	<i>E10 (type I diabetes mellitus)</i>	--
	E10.1 (type I diabetes mellitus <i>with ketoacidosis</i> )	<i>250.1 (diabetes with ketoacidosis)</i>
	- E10.10 (type I diabetes mellitus with ketoacidosis <i>without coma</i> )	- 250.11 (diabetes with ketoacidosis, type I [juvenile type], <i>not stated as uncontrolled</i> ) - 250.13 (diabetes with ketoacidosis, type I [juvenile type], <i>uncontrolled</i> )
	- E10.11 (type I diabetes mellitus with ketoacidosis <i>with coma</i> )	<i>250.3 (diabetes with other coma)</i> - 250.31 (diabetes with other coma, type I [juvenile type], <i>not stated as uncontrolled</i> ) - 250.33 (diabetes with other coma, type I [juvenile type], <i>uncontrolled</i> )
	E10.2 (type I diabetes mellitus <i>with kidney complications</i> )	<i>250.4 (diabetes with renal manifestations)</i>
	- E10.21 (type I diabetes mellitus with diabetic nephropathy)	- 250.43 (diabetes with renal manifestations, type I [juvenile type], <i>uncontrolled</i> )
	- E10.22 (type I diabetes mellitus with diabetic chronic kidney disease)	- 250.41 (diabetes with renal manifestations, type I [juvenile type], <i>not stated as uncontrolled</i> )
	- E10.29 (type I diabetes mellitus with other diabetic kidney complication)	
		<i>(continued on next page)</i>



	E10.3 (type I diabetes mellitus <i>with ophthalmic complications</i> )	250.5 ( <i>diabetes with ophthalmic manifestations</i> )
	E10.31 (type I diabetes mellitus <i>with unspecified diabetic retinopathy</i> )	<ul style="list-style-type: none"> <li>- 250.51 (diabetes with ophthalmic manifestations, type I [juvenile type], <i>not stated as uncontrolled</i>)</li> <li>- 250.53 (diabetes with ophthalmic manifestations, type I [juvenile type], <i>uncontrolled</i>)</li> </ul>
	<ul style="list-style-type: none"> <li>- E10.311 (type I diabetes mellitus with unspecified diabetic retinopathy <i>with macular edema</i>)</li> <li>- E10.319 (type I diabetes mellitus with unspecified diabetic retinopathy <i>without macular edema</i>)</li> </ul>	[Conversion of ICD10 to ICD9 code requires additional ICD9 code for exact match]
	E10.32 (type I diabetes mellitus <i>with mild nonproliferative diabetic retinopathy</i> )	<ul style="list-style-type: none"> <li>- E10.321 (type I diabetes mellitus with mild nonproliferative diabetic retinopathy <i>with macular edema</i>)</li> <li>- E10.329 (type I diabetes mellitus with mild nonproliferative diabetic retinopathy <i>without macular edema</i>)</li> </ul>
	E10.33 (type I diabetes mellitus <i>with moderate nonproliferative diabetic retinopathy</i> )	<ul style="list-style-type: none"> <li>- E10.331 (type I diabetes mellitus with moderate nonproliferative diabetic retinopathy <i>with macular edema</i>)</li> <li>- E10.339 (type I diabetes mellitus with moderate nonproliferative diabetic retinopathy <i>without macular edema</i>)</li> </ul>
	E10.34 (type I diabetes mellitus <i>with severe nonproliferative diabetic retinopathy</i> )	<ul style="list-style-type: none"> <li>- E10.341 (type I diabetes mellitus with severe nonproliferative diabetic retinopathy <i>with macular edema</i>)</li> <li>- E10.349 (type I diabetes mellitus with severe nonproliferative diabetic retinopathy <i>without macular edema</i>)</li> </ul>
	E10.35 (type I diabetes mellitus <i>with proliferative diabetic retinopathy</i> )	<ul style="list-style-type: none"> <li>- E10.351 (type I diabetes mellitus with proliferative diabetic retinopathy <i>with macular edema</i>)</li> <li>- E10.359 (type I diabetes mellitus with proliferative diabetic retinopathy <i>without macular edema</i>)</li> </ul>
	E10.36 (type I diabetes mellitus <i>with diabetic cataract</i> )	
	E10.39 (type I diabetes mellitus <i>with other diabetic ophthalmic complication</i> )	(continued on next page)



	E10.4 (type I diabetes mellitus with neurological complications)	250.6 (diabetes with neurological manifestations)
	- E10.40 (type I diabetes mellitus with diabetic neuropathy, unspecified)	- 250.61 (diabetes with neurological manifestations, type I [juvenile type], <i>not stated as uncontrolled</i> )
	- E10.41 (type I diabetes mellitus with diabetic mononeuropathy)	- 250.63 (diabetes with neurological manifestations, type I [juvenile type], <i>uncontrolled</i> )
	- E10.42 (type I diabetes mellitus with diabetic neuropathy)	[Conversion of ICD10 to ICD9 code requires additional ICD9 code for exact match]
	- E10.43 (type I diabetes mellitus with diabetic autonomic polyneuropathy)	
	- E10.44 (type I diabetes mellitus with diabetic amyotrophy)	
	- E10.49 (type I diabetes mellitus with other diabetic neurological complication)	
	E10.5 (type I diabetes mellitus with circulatory complications)	250.7 (diabetes with peripheral circulatory disorders)
	- E10.51 (type I diabetes mellitus with diabetic peripheral angiopathy <i>without gangrene</i> )	- 250.71 (diabetes with peripheral circulatory disorders, type I [juvenile type], <i>not stated as uncontrolled</i> )
	- E10.52 (type I diabetes mellitus with diabetic peripheral angiopathy <i>with gangrene</i> )	- 250.73 (diabetes with peripheral circulatory disorders, type I [juvenile type], <i>uncontrolled</i> )
	- E10.59 (type I diabetes mellitus with other circulatory complications)	[Conversion of ICD10 to ICD9 code requires additional ICD9 code for exact match]
	E10.6 (type I diabetes mellitus with other specified complications)	250.8 (diabetes with other specified manifestations)
	E10.61 (type I diabetes mellitus with diabetic arthropathy)	--
	- E10.610 (type I diabetes mellitus with diabetic neuropathic arthropathy)	- 250.61 (above)
	- E10.618 (type I diabetes mellitus with other diabetic arthropathy)	- 250.81 (diabetes with other specified manifestations, type I [juvenile type], <i>not stated as uncontrolled</i> )
	E10.62 (type I diabetes mellitus with skin complications)	
	- E10.620 (type I diabetes mellitus with diabetic dermatitis)	
	- E10.621 (type I diabetes mellitus with foot ulcer)	
	- E10.622 (type I diabetes mellitus with other skin ulcer)	
	- E10.628 (type I diabetes mellitus with other skin complications)	(continued on next page)

	E10.63 (type I diabetes mellitus <i>with oral complications</i> )	
	- E10.630 (type I diabetes mellitus with periodontal disease)	
	- E10.638 (type I diabetes mellitus with other oral complications)	
	E10.64 (type I diabetes mellitus <i>with hypoglycemia</i> )	--
	- E10.641 (type I diabetes mellitus with hypoglycemia <i>with coma</i> )	- 250.31 (above)
	- E10.649 (type I diabetes mellitus with hypoglycemia <i>without coma</i> )	- 250.81 (above)
	E10.65 (type I diabetes mellitus <i>with hyperglycemia</i> )	- 250.03 (diabetes mellitus without mention of complication, type I [juvenile type], <i>uncontrolled</i> ) - 250.81 (above)
	E10.69 (type I diabetes mellitus <i>with other specified complication</i> )	- 250.21 (diabetes with hyperosmolarity, type I [juvenile type], <i>not stated as uncontrolled</i> ) - 250.83 (diabetes with other specified manifestations, type I [juvenile type], <i>uncontrolled</i> ) - 250.23 (diabetes with hyperosmolarity, type I [juvenile type], <i>uncontrolled</i> )
	E10.8 (type I diabetes mellitus <i>with unspecified complications</i> )	250.9 ( <i>diabetes with unspecified complication</i> ) - 250.91 (diabetes with unspecified complication, type I [juvenile type], <i>not stated as uncontrolled</i> ) - 250.93 (diabetes with unspecified complication, type I [juvenile type], <i>uncontrolled</i> )
	E10.9 (type I diabetes without complications)	250.0 ( <i>diabetes mellitus without mention of complication</i> ) - 250.01 (diabetes mellitus without mention of complication, type I [juvenile type], <i>not stated as uncontrolled</i> )
Diabetes mellitus <i>(Type II)</i>	<i>E11 (type II diabetes mellitus)</i>	--
	E11.0 (type II diabetes mellitus with hyperosmolarity)	250.2 ( <i>diabetes with hyperosmolarity</i> )
	- E11.00 (type II diabetes mellitus with hyperosmolarity without nonketotic hyperglycemic-hyperosmolar coma [NKHHC])	- 250.20 (diabetes with hyperosmolarity, type II or unspecified type, <i>not stated as uncontrolled</i> ) - 250.22 (diabetes with hyperosmolarity, type II or unspecified type, <i>uncontrolled</i> )

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	- E11.01 (type II diabetes mellitus with hyperosmolarity with coma)	- 250.32 (diabetes with other coma, type II or unspecified type, <i>uncontrolled</i> )
	E11 .2 (type II diabetes mellitus with kidney complications)	250.4 ( <i>diabetes with renal manifestations</i> )
	- E11.21 (type II diabetes mellitus <i>with diabetic nephropathy</i> )	- 250.42 (diabetes with renal manifestations, type II or unspecified type, <i>uncontrolled</i> )
	- E11.22 (type II diabetes mellitus <i>with diabetic chronic kidney disease</i> )	- 250.40 (diabetes with renal manifestations, type II or unspecified type, <i>not stated as uncontrolled</i> )
	- E11.29 (type II diabetes mellitus <i>with other diabetic kidney complication</i> )	
	E11 .3 (type II diabetes mellitus with ophthalmic complications)	250.5 ( <i>diabetes with ophthalmic manifestations</i> )
	E11 .31 (type II diabetes mellitus with unspecified diabetic retinopathy)	--
	- E11.311 (type II diabetes mellitus with unspecified diabetic retinopathy <i>with macular edema</i> )	- 250.50 (diabetes with ophthalmic manifestations, type II or unspecified type, <i>not stated as uncontrolled</i> )
	- E11.319 (type II diabetes mellitus with unspecified diabetic retinopathy <i>without macular edema</i> )	- 250.52 (diabetes with ophthalmic manifestations, type II or unspecified type, <i>uncontrolled</i> )
	E11.32 (type II diabetes mellitus with mild nonproliferative diabetic retinopathy)	<i>[Conversion of ICD10 to ICD9 code requires additional ICD9 code for exact match]</i>
	- E11.321 (type II diabetes mellitus with mild nonproliferative diabetic retinopathy <i>with macular edema</i> )	
	- E11.329 (type II diabetes mellitus with mild nonproliferative diabetic retinopathy <i>without macular edema</i> )	
	E11.33 (type II diabetes mellitus <i>with moderate nonproliferative diabetic retinopathy</i> )	
	- E11.331 (type II diabetes mellitus with moderate nonproliferative diabetic retinopathy <i>with macular edema</i> )	
	- E11.339 (type II diabetes mellitus with moderate nonproliferative diabetic retinopathy <i>without macular edema</i> )	
	E11.34 (type II diabetes mellitus <i>with severe nonproliferative diabetic retinopathy</i> )	
	- E11.341 (type II diabetes mellitus with severe nonproliferative diabetic retinopathy <i>with macular edema</i> )	
	- E11.349 (type II diabetes mellitus with severe nonproliferative diabetic retinopathy <i>without macular edema</i> )	

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	E11.35 (type II diabetes mellitus <i>with proliferative diabetic retinopathy</i> )	
	- E11.351 (type II diabetes mellitus with proliferative diabetic retinopathy with macular edema)	
	- E11.39 (type II diabetes mellitus <i>with other diabetic ophthalmic complication</i> )	
	- E11.36 (type II diabetes mellitus with diabetic cataract)	
	- E11.39 (type II diabetes mellitus with other diabetic ophthalmic complication)	
	E11.4 (type II diabetes mellitus <i>with neurological complications</i> )	250.6 ( <i>diabetes with neurological manifestations</i> )
	- E11.40 (type II diabetes mellitus with diabetic neuropathy, unspecified)	- 250.60 (diabetes with neurological manifestations, type II or unspecified type, <i>not stated as uncontrolled</i> )
	- E11.41 (type II diabetes mellitus <i>with diabetic mononeuropathy</i> )	- 250.62 (diabetes with neurological manifestations, type II or unspecified type, <i>uncontrolled</i> )
	- E11.42 (type II diabetes mellitus <i>with diabetic neuropathy</i> )	[Conversion of ICD10 to ICD9 code requires additional ICD9 code for exact match]
	- E11.43 (type II diabetes mellitus <i>with diabetic autonomic polyneuropathy</i> )	
	- E11.44 (type II diabetes mellitus <i>with diabetic amyotrophy</i> )	
	- E11.49 (type II diabetes mellitus <i>with other diabetic neurological complication</i> )	
	E11.5 (type II diabetes mellitus <i>with circulatory complications</i> )	250.7 ( <i>diabetes with peripheral circulatory disorders</i> )
	- E11.51 (type II diabetes mellitus with diabetic peripheral angiopathy without gangrene)	- 250.70 (diabetes with peripheral circulatory disorders, type II or unspecified type, <i>not stated as uncontrolled</i> )
	- E11.52 (type II diabetes mellitus with diabetic peripheral angiopathy <i>with gangrene</i> )	- 250.72 (diabetes with peripheral circulatory disorders, type II or unspecified type, <i>uncontrolled</i> )
	- E11.59 (type II diabetes mellitus with other circulatory complications)	[Conversion of ICD10 to ICD9 code requires additional ICD9 code for exact match]
	E11.6 (type II diabetes mellitus <i>with other specified complications</i> )	250.8 ( <i>diabetes with other specified manifestations</i> )
	E11.61 (type II diabetes mellitus <i>with diabetic arthropathy</i> )	--
	- E11.610 (type II diabetes mellitus <i>with diabetic neuropathic arthropathy</i> )	- 250.60 (above) (continued on next page)



	<ul style="list-style-type: none"> <li>- E11.618 (type II diabetes mellitus with other diabetic arthropathy)</li> </ul>
	<p>E11.62 (type II diabetes mellitus <i>with skin complications</i>)</p> <ul style="list-style-type: none"> <li>- E11.620 (type II diabetes mellitus with diabetic dermatitis)</li> </ul>
	<ul style="list-style-type: none"> <li>- E11.621 (type II diabetes mellitus with foot ulcer)</li> </ul>
	<ul style="list-style-type: none"> <li>- E11.622 (type II diabetes mellitus with other skin ulcer)</li> </ul>
	<ul style="list-style-type: none"> <li>- E11.628 (type II diabetes mellitus with other skin complications)</li> </ul>
	<p>E11.63 (type II diabetes mellitus <i>with oral complications</i>)</p> <ul style="list-style-type: none"> <li>- E11.630 (type II diabetes mellitus with periodontal disease)</li> </ul>
	<ul style="list-style-type: none"> <li>- E11.638 (type II diabetes mellitus with other oral complications)</li> </ul>
	<p>E11.64 (type II diabetes mellitus <i>with hypoglycemia</i>)</p> <ul style="list-style-type: none"> <li>- E11.641 (type II diabetes mellitus with hypoglycemia with coma)</li> </ul>
	<ul style="list-style-type: none"> <li>- E11.649 (type II diabetes mellitus with hypoglycemia without coma)</li> </ul>
	<p>E11.65 (type II diabetes mellitus with hyperglycemia)</p> <ul style="list-style-type: none"> <li>- 250.02 (diabetes mellitus without mention of complication, type II or unspecified type, <i>uncontrolled</i>)</li> </ul>
	<p>E11.69 (type II diabetes mellitus <i>with other specified complication</i>)</p> <ul style="list-style-type: none"> <li>- 250.10 (diabetes with ketoacidosis, <i>type II or unspecified type, not stated as uncontrolled</i>)</li> <li>- 250.82 (diabetes with other specified manifestations, type II or unspecified type, <i>uncontrolled</i>)</li> <li>- 250.12 (diabetes with ketoacidosis, type II or unspecified type, <i>uncontrolled</i>)</li> </ul>
	<p>E11.8 (type II diabetes mellitus <i>with unspecified complications</i>)</p> <ul style="list-style-type: none"> <li>- 250.9 (diabetes with <i>unspecified complication</i>) <ul style="list-style-type: none"> <li>- 250.90 (diabetes with unspecified complication, type II or unspecified type, <i>not stated as uncontrolled</i>)</li> <li>- 250.92 (diabetes with unspecified complication, type II or unspecified type, <i>uncontrolled</i>)</li> </ul> </li> </ul>

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	E11.9 (type II diabetes without complications)	250.0 ( <i>diabetes mellitus without mention of complication</i> ) - 250.00 (diabetes mellitus without mention of complication, type II or unspecified type, <i>not stated as uncontrolled</i> )
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### **Development and Revisions**

- In March of 2016 the case definition was updated to include ICD10 codes.
- The case definition was originally developed by the AFHSC Medical Surveillance Monthly Report (MSMR) staff for the MSMR article on diabetes mellitus.<sup>2</sup>

### *Code Set Determination and Rationale*

- Females who have any of the following ICD9 codes (650-669; V27) / ICD10 codes (O00-O9A; Z37 (outcome of delivery) for labor and delivery in any diagnostic position *within 6 months* after their incident diabetes diagnosis are excluded from the analysis due to the assumption that they had gestational diabetes. Such individuals can be counted as incident cases if *at least* 6 months since their pregnancy ended unless they again become pregnant and again qualify for the exclusion.

### **Reports**

None

### **Review**

Mar 2016	Case definition reviewed and updated by the AFHSC Surveillance Methods and Standards (SMS) working group
Jul 2015	Case definition reviewed and adopted by the AFHSC Surveillance Methods and Standards (SMS) working group.
Feb 2009	Case definition developed by AFHSC MSMR staff.

### **Comments**

None

<sup>2</sup> Armed Forces Health Surveillance Center. Diabetes Mellitus, Active Component, U.S. Armed Forces, 1997-2007. *Medical Surveillance Monthly Report (MSMR)*. 2009 Feb; Vol 16(2): 7-9.

