



# ESP CASE DETECTION ALGORITHM

## Hypertension, Diagnosed Hypertension and Controlled Hypertension

Document Version 1.4

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### Modification History

Version	Date	Modification	By
1.4	10/31/2019	Updates per development feedback	Bob Zambarano
1.3	1/29/2019	Added diagnosed and controlled hypertension	DPM/DPH
1.2	10/11/2017	Added ESP Logo and MDPH branding	DPM
1.1	6/30/2017	Transferred to new template	DPM
1.0	7/21/2016	Original hypertension algorithm	DPM

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## 1. Overview

The purpose of this document is to describe the criteria used to identify Hypertension, Diagnosed Hypertension and Controlled Hypertension in MDPHnet data.

## Hypertension

### 2. Criteria used to identify cases using ESP data

#### I. CASE CRITERIA

Either one of the following:

- Systolic blood pressure  $\geq 140^*$  or diastolic blood pressure  $\geq 90$  or both on 2 or more occasions within a one year period
- Diagnosis code for hypertension and (prescription or refill) for at least one antihypertensive medication within one year of hypertension diagnosis code

\* if patient age  $\geq 80$  then the eligible systolic threshold for hypertension is  $\geq 150$ mm Hg

#### II. ICD-9/ICD-10 CODES FOR CASE CRITERIA

ICD-9	401.x	Essential Hypertension
	405.x	Secondary Hypertension
ICD-10	I10	Essential Hypertension
	I15	Secondary Hypertension

#### III. MEDICATIONS FOR CASE CRITERIA

Diuretics	Hydrochlorothiazide
	chlorthalidone
	indapamide
Calcium channel antagonists	amlodipine
	clevidipine
	felodipine
	isradipine
	nicardipine
	nifedipine
	nisoldipine
	diltiazem
	verapamil
Beta-blockers	acebutolol
	atenolol



	betaxolol
	bisoprolol
	carvedilol
	labetolol
	metoprolol
	nadolol
	nebivolol
	pindolol
	propranolol
ACE inhibitors	benazepril
	captopril
	enalapril
	fosinopril
	lisinopril
	moexipril
	perindopril
	quinapril
	ramipril
	trandolapril
Angiotensin receptor blockers	candesartan
	eprosartan
	irbesartan
	losartan
	olmesartan
	telmisartan
	valsartan
Alpha antagonists	clonidine
	doxazosin
	guanfacine
	methyldopa
	prazosin
	terazosin

#### IV. TIME WINDOW

Classification of hypertension persists so long as patient has any of the following indicators:

- Measured systolic blood pressure  $\geq 140$
- Measured diastolic blood pressure  $\geq 90$
- ICD9 or ICD10 code for hypertension
- Prescription for an antihypertensive medication

If a patient has none of the above for  $\geq 2$  years, then at the next encounter reclassify as non-hypertensive (i.e. hypertension end-date is at the next encounter  $\geq 730$  days from the last encounter with evidence of ongoing hypertension). Note, however, that if the patient's ONLY hypertension indicators have been high systolic or diastolic blood pressure values but they have NEVER had a hypertension diagnosis or prescription for



antihypertensive med then reclassify as non-hypertensive at the next encounter  $\geq 365$  days from the last recorded elevated systolic or diastolic blood pressure.

Diagnosed Hypertension

**I. CASE CRITERIA**

Cases of diagnosed hypertension are indicated by the following:

- Diagnosis code for hypertension

**II. ICD-9/ICD-10 CODES FOR CASE CRITERIA**

ICD-9	401.x	Essential Hypertension
ICD-10	I10.x	Essential Hypertension

**III. ADDITIONAL INCLUSION/ EXCLUSION CRITERIA:**

- Include only patients between the ages of 18 and 85 years at the index date.
- Exclude hypertension diagnoses for patients with a diagnosis of pregnancy within one year of the diagnosis of hypertension.
  - ICD-9: **V22** (Normal pregnancy), **V23** (Supervision of high-risk pregnancy).
  - ICD-10: **Z33** (Pregnant state), **Z34** (Encounter for supervision of normal pregnancy), **O09** (Supervision of high risk pregnancy).
- Exclude hypertension diagnoses for patients with prior diagnoses for end stage renal disease.
  - ICD-9: **585.6** (End stage renal disease)
  - ICD-10: **N18.6** (End stage renal disease)

**IV. TIME WINDOW**

Classification of hypertension persists so long as patient has any of the following indicators:

- ICD-9 or ICD-10 code for essential hypertension.

Revert classification to no hypertension if  $\geq 2$  years since last hypertension diagnosis,  $\geq 2$  encounters without a hypertension diagnosis,  $\geq 2$  years without hypertension medication, and last measured blood pressure was below 140 systolic and 90 diastolic.

Controlled/Uncontrolled/Unknown Hypertension status

Among patients with essential hypertension defined above (i.e., active **diagnosed** hypertension), assign status valued depending on their most recent BP measures

Controlled

Identify those whose last blood pressure is  $< 140$  systolic blood pressure and  $< 90$  diastolic blood pressure. The last measured blood pressure must be after the date the hypertension was first diagnosed.

Uncontrolled

Identify those whose last blood pressure is  $\geq 140$  systolic or  $\geq 90$  diastolic. The last measured blood pressure must be on or after the date hypertension was first diagnosed



### Unknown

If the initial diagnosis is not accompanied by a BP measure, or if the patient has no encounter with measured blood pressure for 2 years from the last BP measure, status of controlled or uncontrolled hypertension is set to “Unknown”.