



Hypertension in Non-dialysis CKD Patients in China

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OUTLINE

- **Hypertension in CKD**
- **PATRIOTIC Study**
- **Antihypertensive therapy in China**
- **Prospective**

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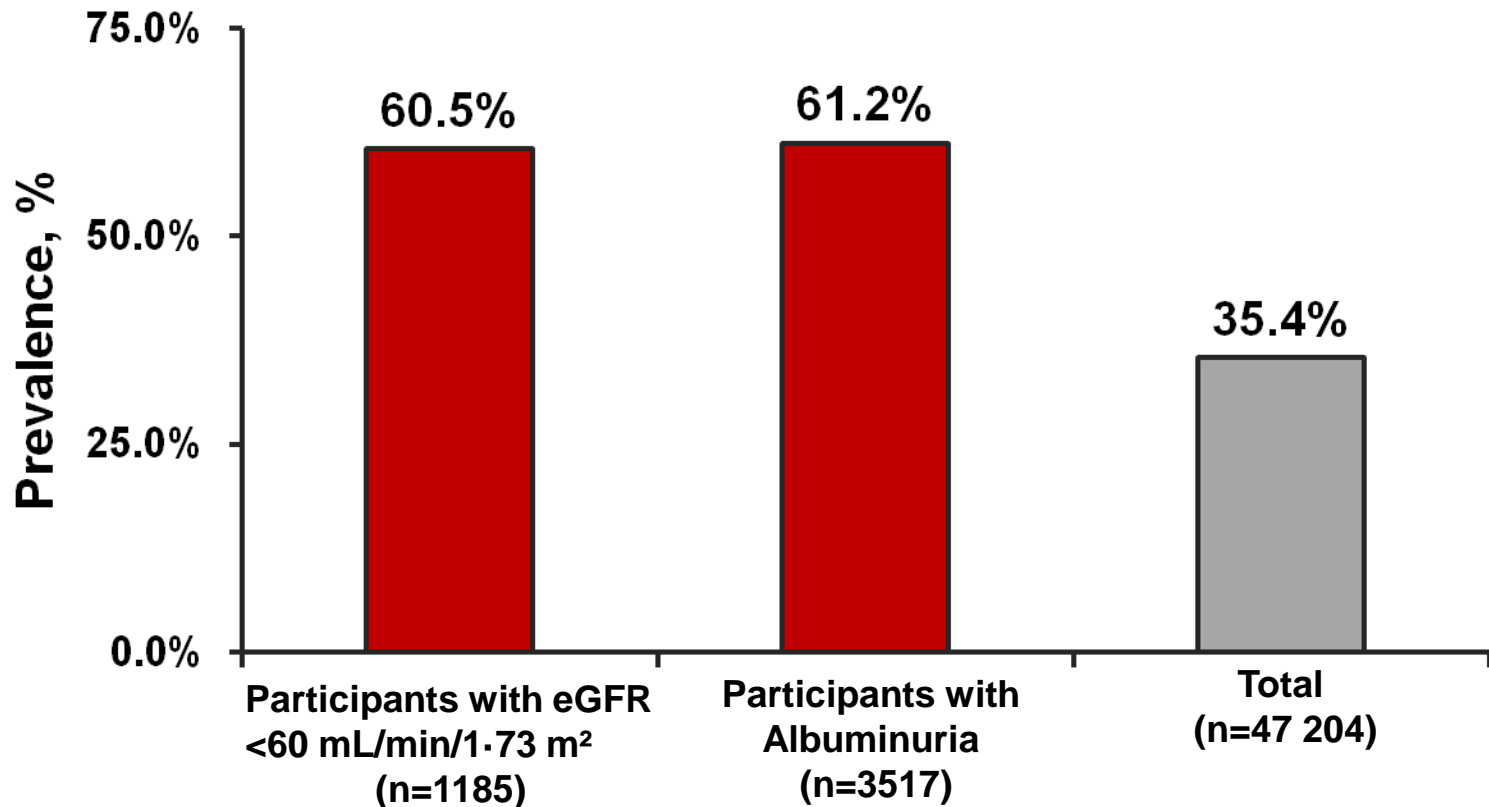
CKD IN CHINA



1 in 10: 1 in 10 Chinese adults have CKD

There are **1,200 millions** CKD patients!

HYPERTENSION IN CHINESE CKD ADULTS



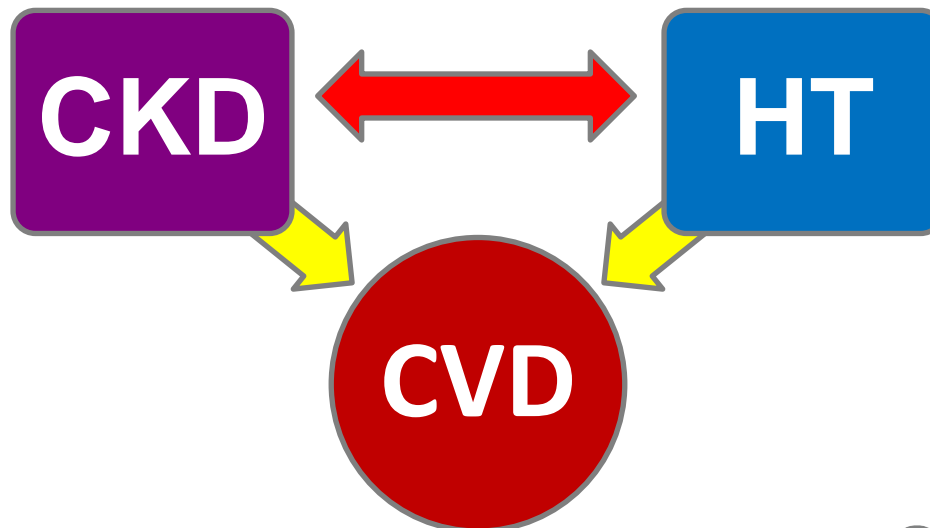
GFR: glomerular filtration rate

Lancet. 2012;379(9818):815-22.

BP CONTROL IS FOOTSTONE OF IMPROVING CKD PATIENTS' CARE



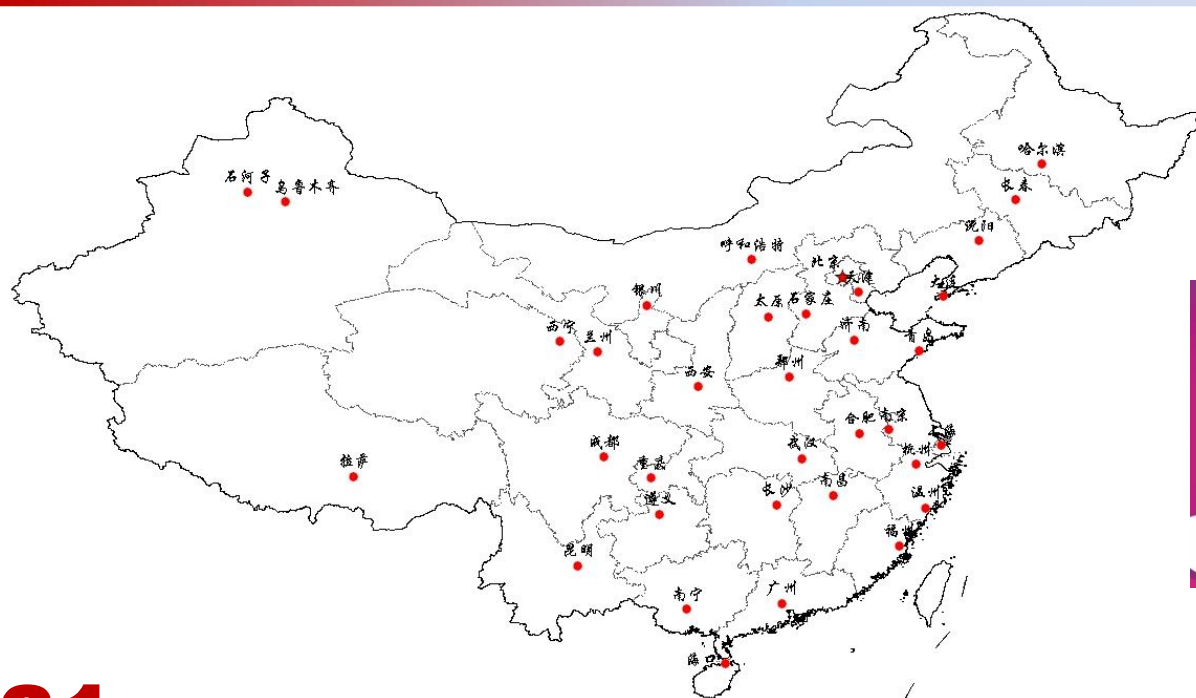
- ◆ There is a strong association between CKD and an elevated BP whereby each can cause or aggravate the other.
- ◆ BP control is fundamental to the care of patients with CKD and is relevant at all stages of CKD regardless of the underlying cause.



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THE SURVEY OF PREVALENCE, AWARENESS AND TREATMENT RATES IN CHRONIC KIDNEY DISEASE PATIENTS WITH HYPERTENSION IN CHINA (PATRIOTIC) STUDY



2009-2010

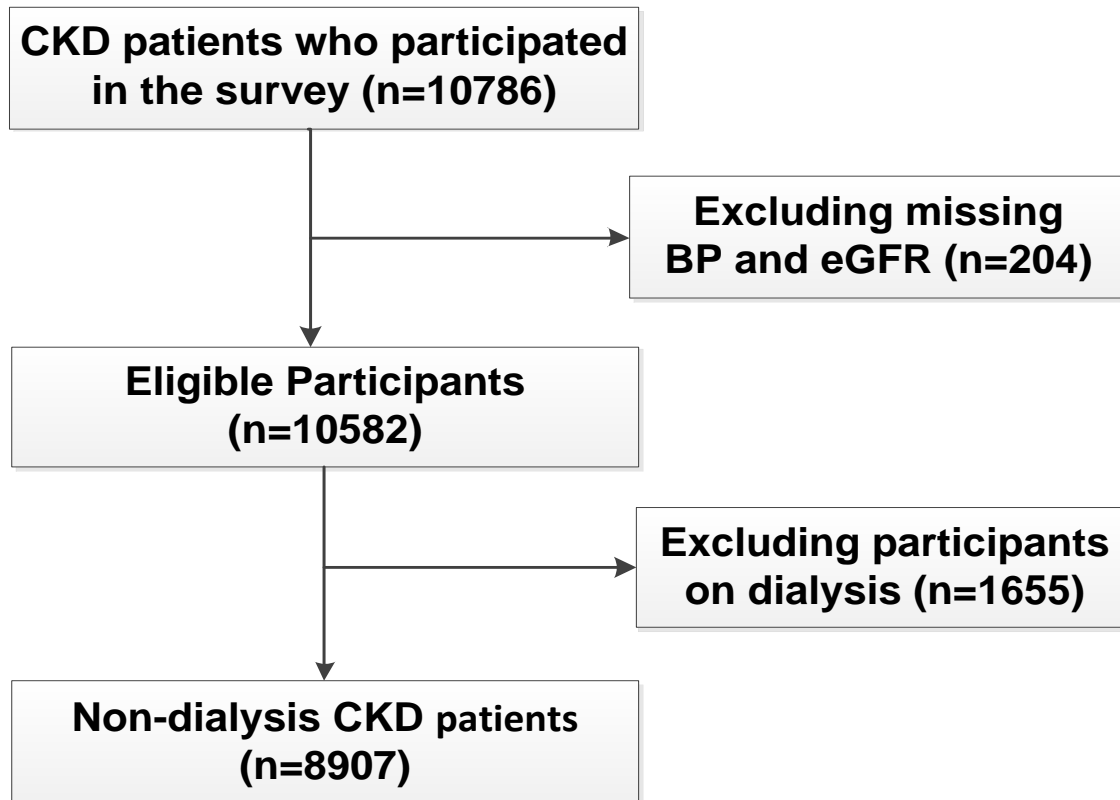


31 provinces, municipalities, and autonomous regions of China

61 tertiary hospitals

10,786 inpatients with CKD

PATRIOTIC STUDY



Flow chart

CHARACTERISTICS OF PARTICIPANTS

| Characteristic | non-dialysis CKD patients |
|--------------------------------|---------------------------|
| Total, n(%) | 8927(100.0) |
| Age, year | 46.9 ± 17.9 |
| Male, n(%) | 4641(52.0) |
| Systolic blood pressure, mmHg | 136.2 ± 23.4 |
| Diastolic blood pressure, mmHg | 82.7 ± 16.7 |
| CKD stages, n(%) | |
| Stage 1 | 3286(36.8) |
| Stage 2 | 1438(16.1) |
| Stage 3a | 622(7.0) |
| Stage 3b | 648(7.3) |
| Stage 4 | 925(10.4) |
| Stage 5 | 2008(22.5) |



RECOMMENDATION STATEMENTS

UAE < 30 mg /24 h

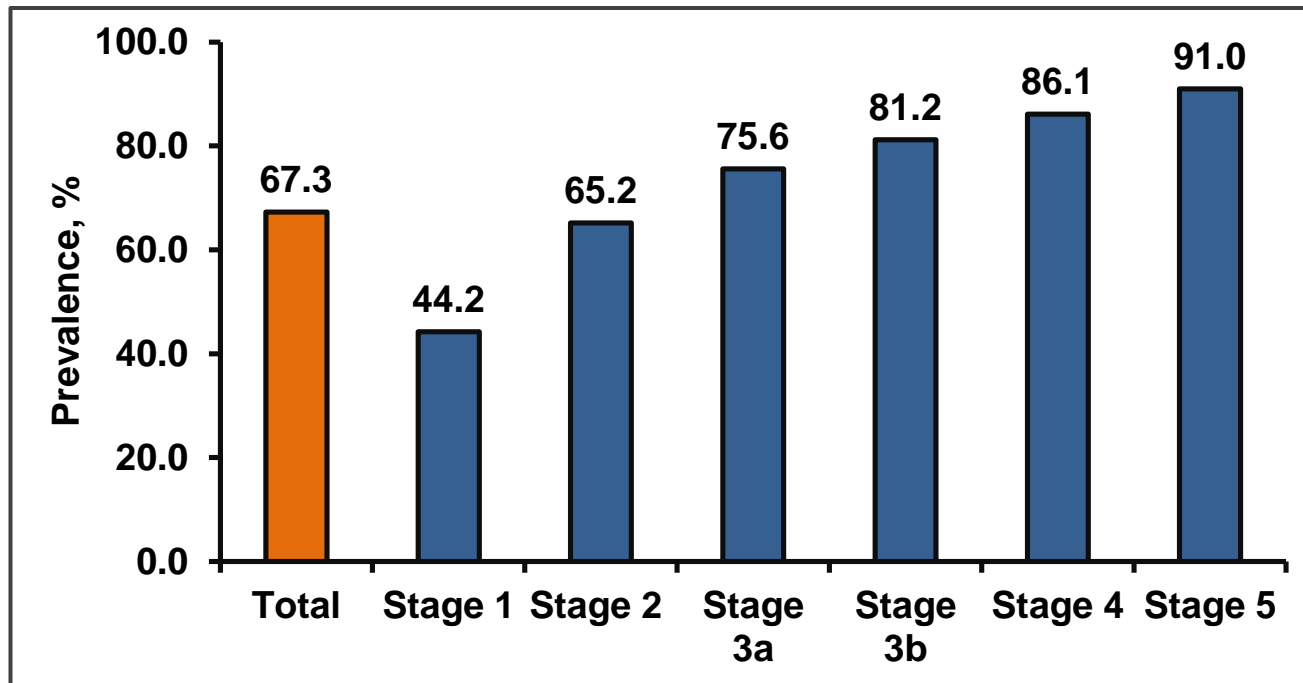
To be treated with BP-lowering drugs to maintain consistently a BP $\leq 140 / 90$ mm Hg.

UAE > 30 mg /24 h

To be treated with BP-lowering drugs to maintain consistently a BP $\leq 130 / 80$ mm Hg.

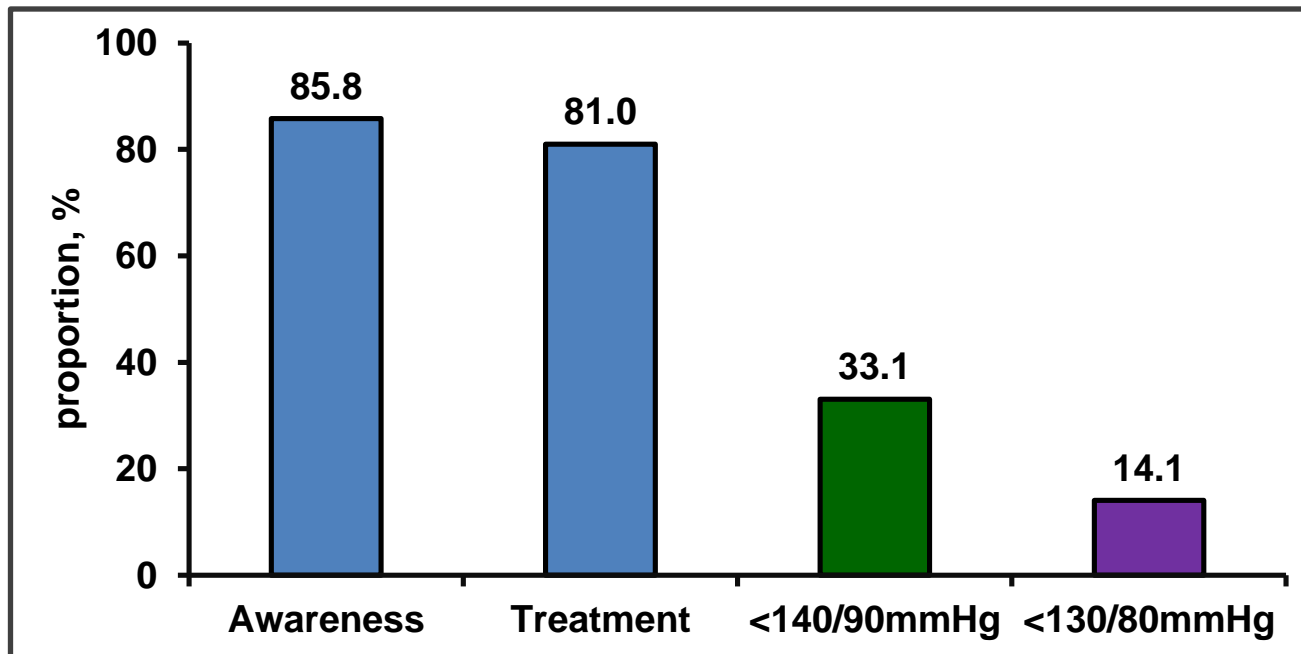
UAE: urine albumin excretion

PATRIOTIC STUDY



67.3% non-dialysis participants with CKD had hypertension in PATRIOTIC study.

PATRIOTIC STUDY



- ◆ **33.1%** participants with CKD and hypertension had BP < 140/90 mm Hg.
- ◆ **Only 14.1%** reached BP target of < 130/80 mm Hg.

CRIC STUDY

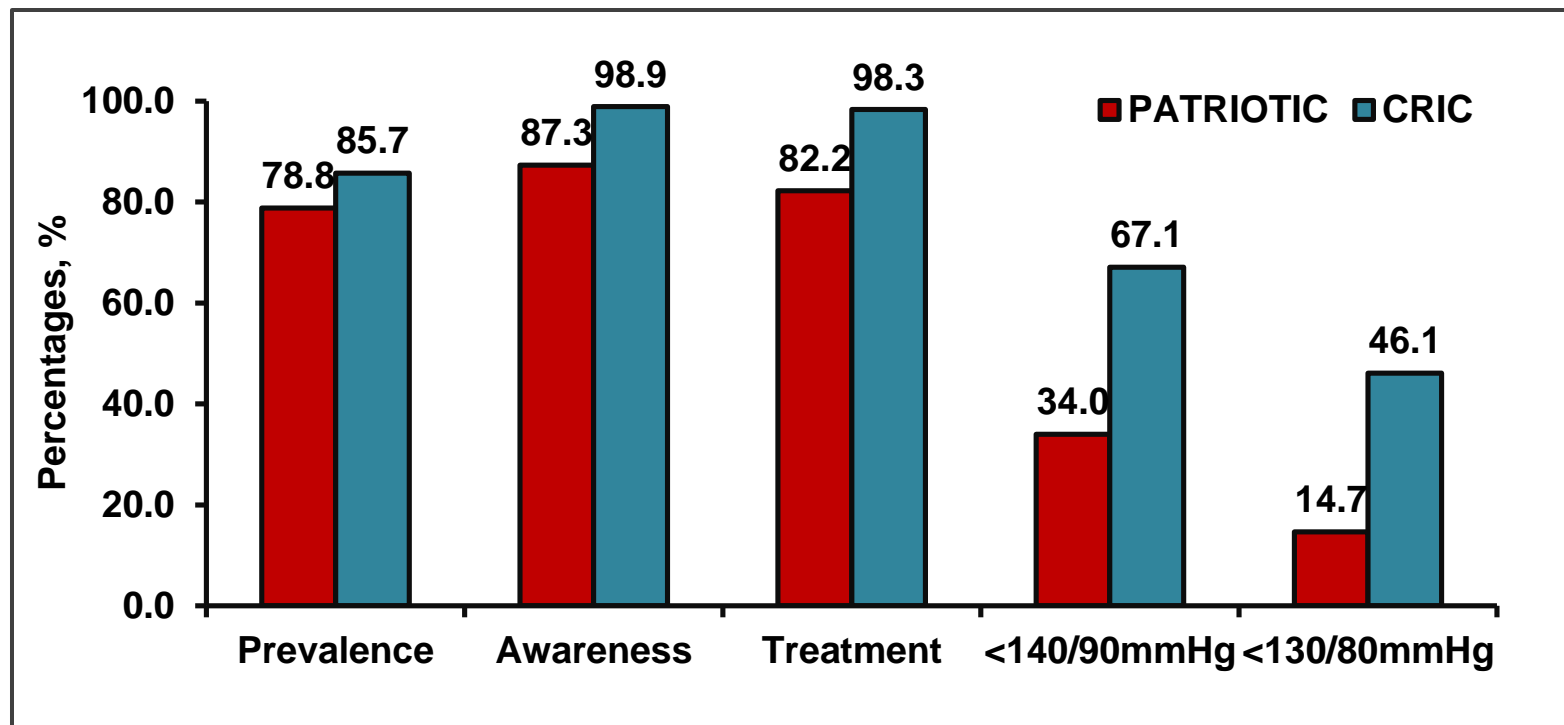


Inclusion criteria

| Age group | eGFR(mL/min/1.73m ²) |
|-----------|----------------------------------|
| 21-44 y | 20-70 |
| 45-64 y | 20-60 |
| 65-74 y | 20-50 |

- ◆ The CRIC Study was a multi-center cohort study that enrolled 3612 CKD patients in United States.
- ◆ In 2010, Muntner et al reported the prevalence, awareness, treatment and control of hypertension in baseline.
- ◆ For comparing the results of our study with CRIC study data, we screened and analyzed 1810 participants who met the inclusion criteria of CRIC study.

COMPARED WITH CRIC STUDY



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ANTIHYPERTENSIVE THERAPY IN CHINA

- ◆ Antihypertensive Drugs Use
- ◆ Resistant Hypertension
- ◆ Patient Compliance

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RECOMMENDED FIRST-LINE DRUGS

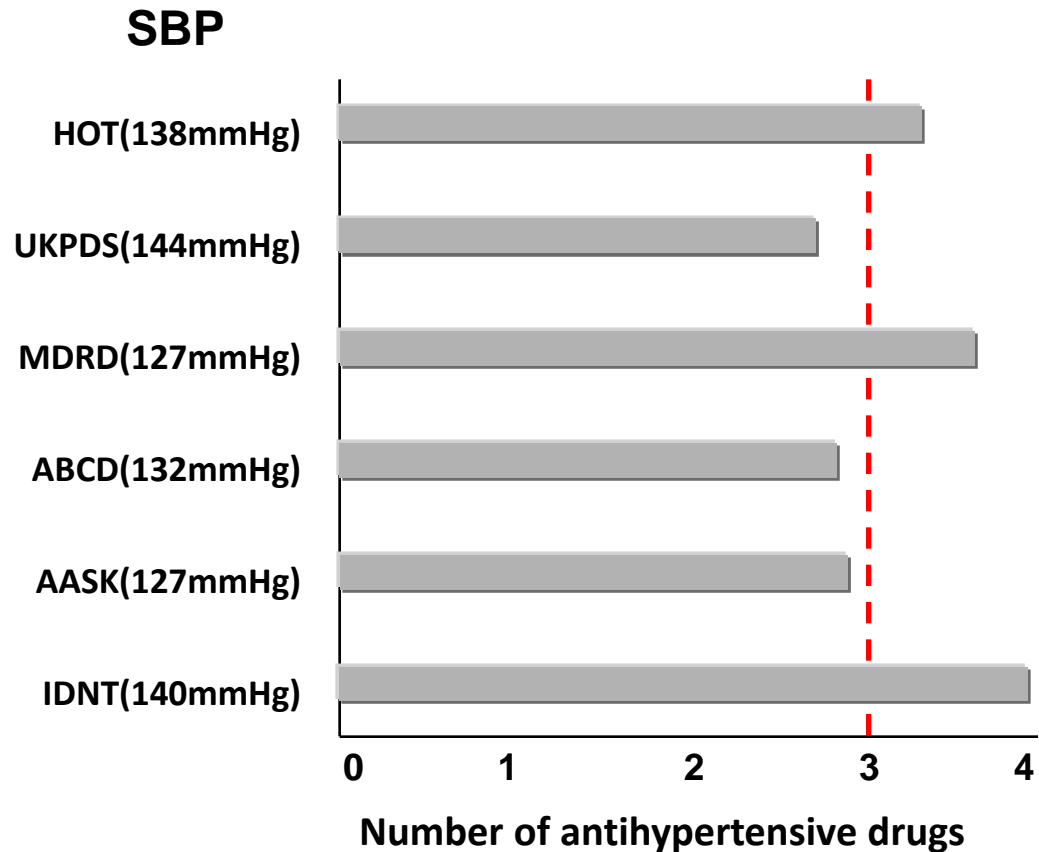
| Guideline | Population | First-line drug | Grade |
|---|--|-----------------|-------|
| JNC8 2014 | CKD | ACEI or ARB | B |
| ESH/ESC 2013 | CKD | ACEI or ARB | A |
| KDIGO 2012 | CKD ND patients without diabetes mellitus (UAE 30-300mg / 24h) | ACEI or ARB | 2D |
| | CKD ND patients without diabetes mellitus (UAE >300mg / 24h) | ACEI or ARB | 1B |
| | CKD ND patients with diabetes mellitus (UAE 30-300mg / 24h) | ACEI or ARB | 2D |
| | CKD ND patients with diabetes mellitus (UAE >300mg / 24h) | ACEI or ARB | 1B |
| Guidelines for Prevention and Treatment of Hypertension in China 2010 | CKD | ACEI or ARB | - |

MOST CKD PATIENTS NEED DIURETICS



- ◆ The antihypertensive and anti-albuminuric effects of ACEIs and ARBs are complemented by dietary sodium restriction or administration of diuretics.
- ◆ ACEIs and ARBs are therefore valuable adjuncts to diuretics for the treatment of high BP and vice versa.

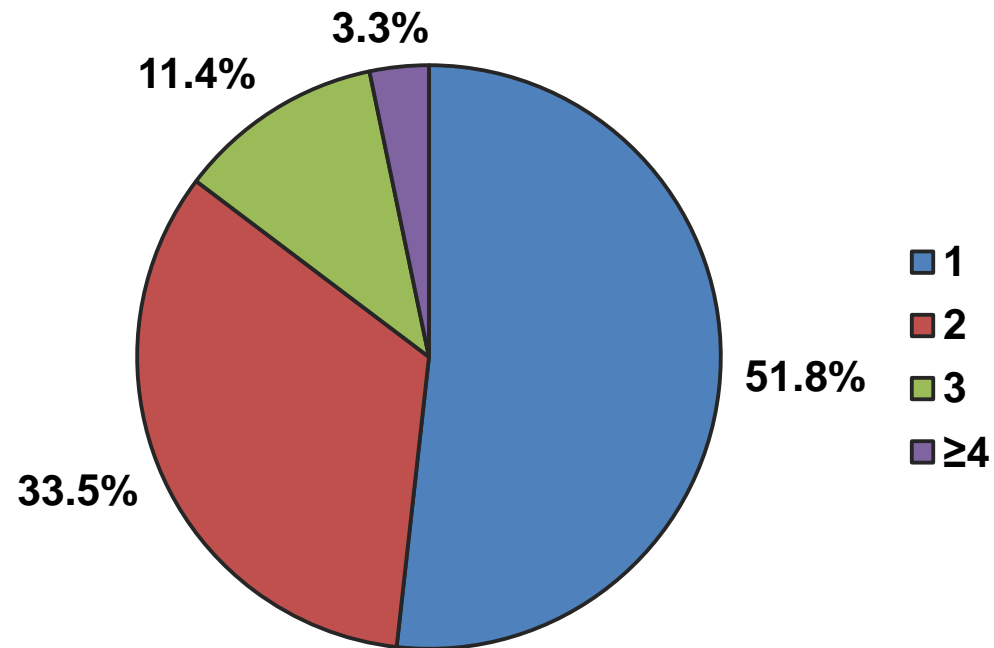
MOST CKD PATIENTS NEED ≥ 3 DRUGS



ANTIHYPERTENSIVE DRUGS

| | n | % |
|----------------------------|-------------|-------------|
| Total | 4435 | 100 |
| dCCB | 2831 | 63.8 |
| RAS blockers | 2248 | 50.7 |
| ARB | 1490 | 33.6 |
| ACEI | 929 | 20.9 |
| β-blockers | 811 | 18.3 |
| Diuretics | 458 | 10.3 |
| Thiazide diuretic | 177 | 4.0 |
| Loop diuretic | 247 | 5.6 |
| Aldosterone antagonist | 3 | 0.1 |
| Potassium sparing diuretic | 79 | 1.8 |
| α,β-blockers | 214 | 4.8 |
| α-blockers | 153 | 3.4 |

NUMBERS OF ANTIHYPERTENSIVE DRUGS

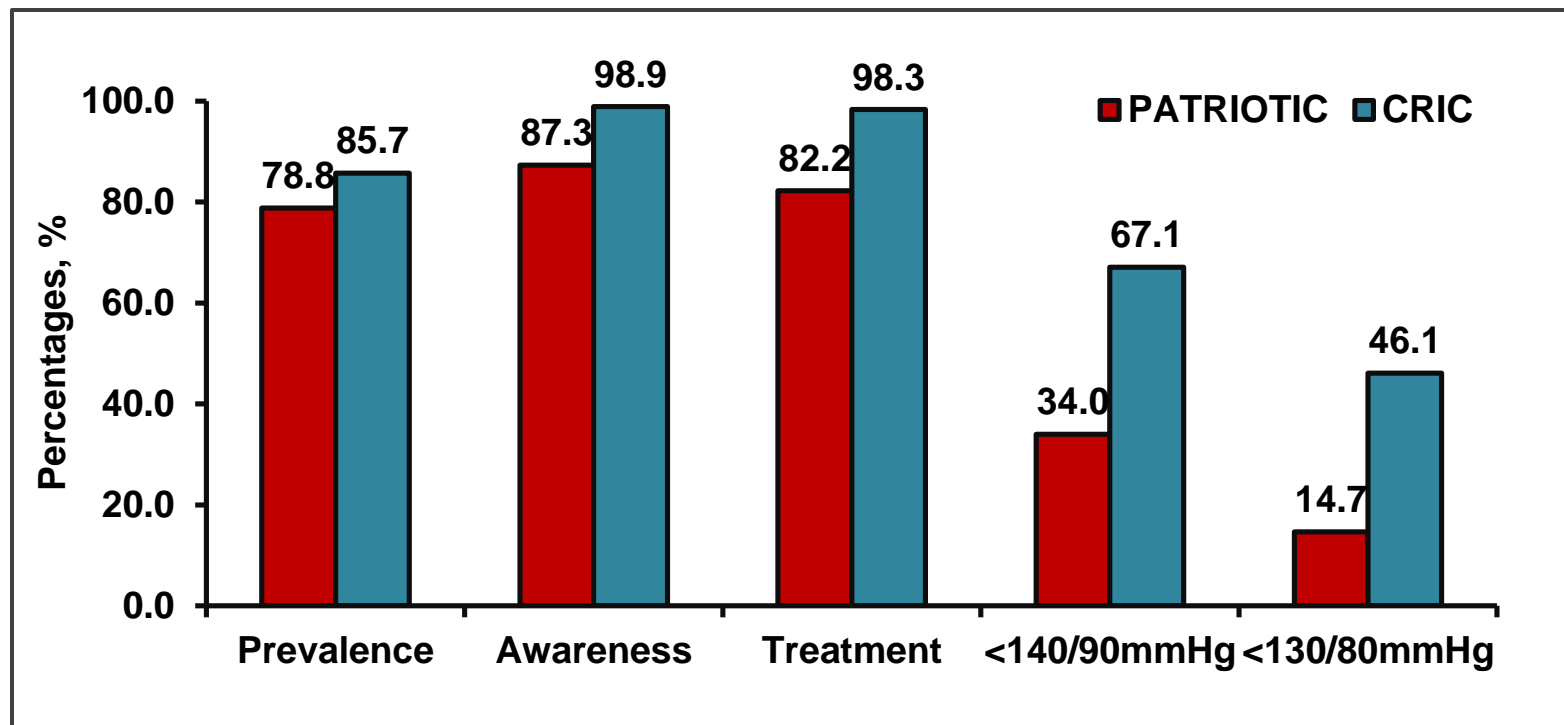


PATRIOTIC study

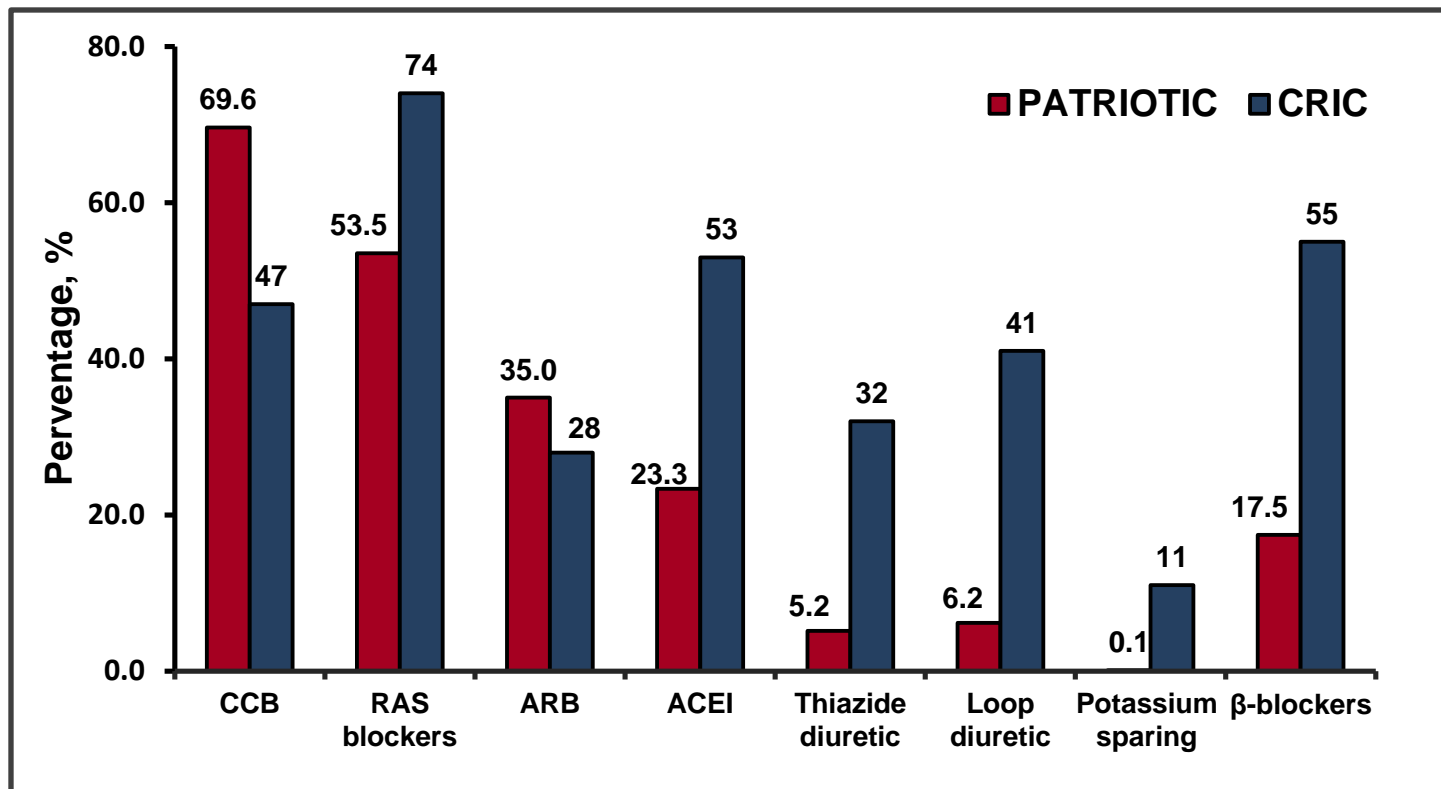
DRUG COMBINATIONS

| Drug combination | Drug use, % |
|---------------------------------|-------------|
| CCB + RAS blockers | 40.7 |
| CCB + β blockers | 20.8 |
| CCB + $\alpha\beta$ blockers | 5.4 |
| RAS blockers + β blockers | 4.8 |
| CCB + Diuretics | 4.5 |
| RAS blockers + Diuretics | 3.2 |

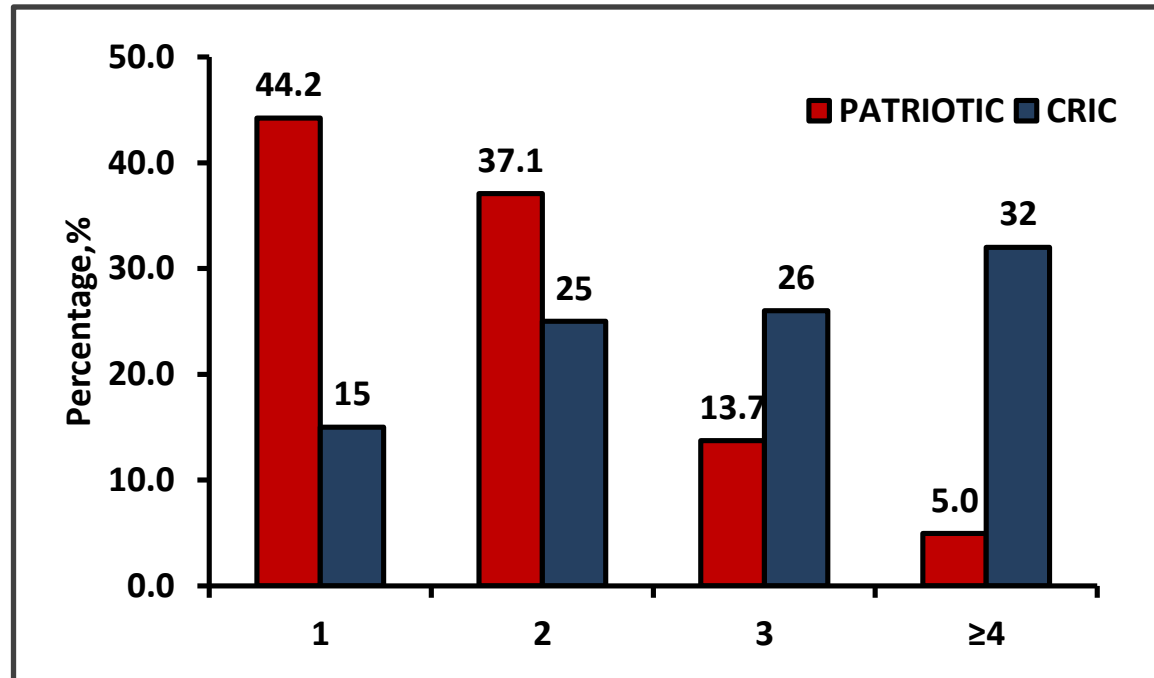
COMPARED WITH CRIC STUDY



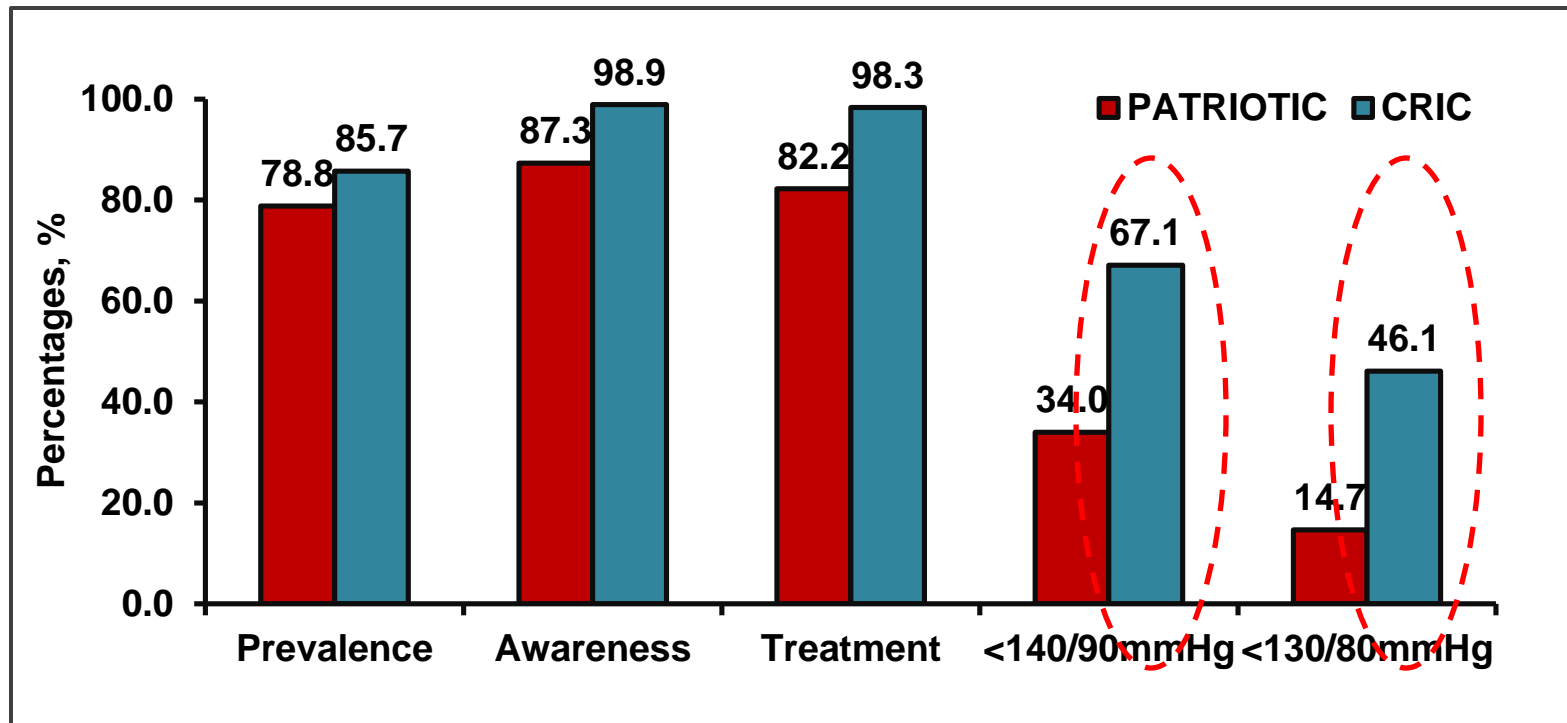
ANTIHYPERTENSIVE DRUGS



NUMBERS OF ANTIHYPERTENSIVE DRUGS



IT'S DIFFICULT, BUT NOT IMPOSSIBLE TO REACH BP TARGET IN CKD PATIENTS



ANTIHYPERTENSIVE THERAPY IN CHINA

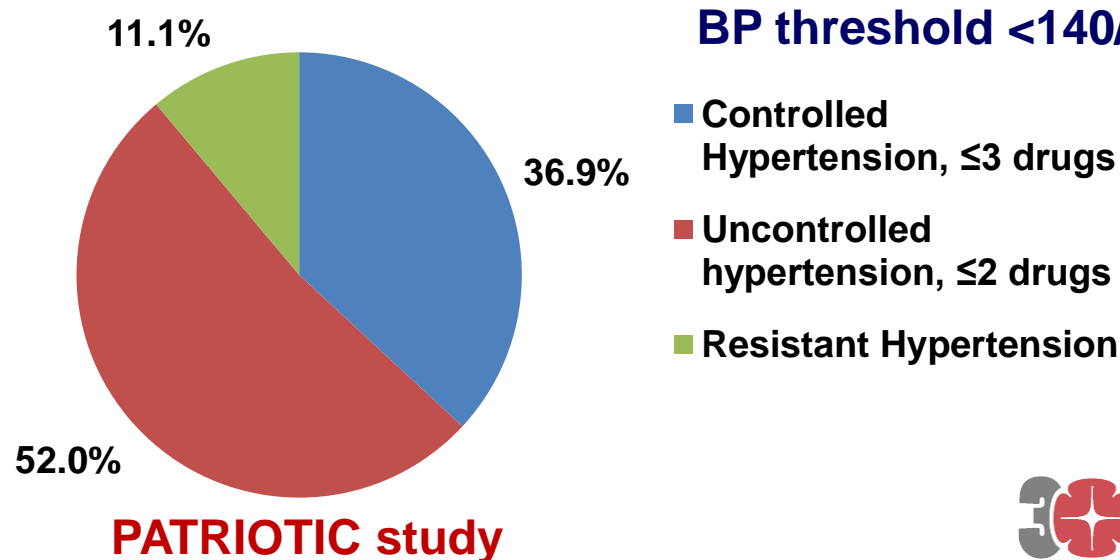
- ◆ Antihypertensive Drugs Use
- ◆ **Resistant Hypertension**
- ◆ Patient Compliance

RESISTANT HYPERTENSION

Hypertension. 2008;51:1403-1419

DEFINITION

Resistant hypertension (RH) is defined as BP that remains above goal in spite of the concurrent use of 3 antihypertensive agents of different classes. Ideally, one of the 3 agents should be a diuretic and all agents should be prescribed at optimal dose amounts.



ANTIHYPERTENSIVE THERAPY IN CHINA

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- ◆ **Patient Compliance**

POOR ADHERENCE TO ANTIHYPERTENSIVE THERAPY

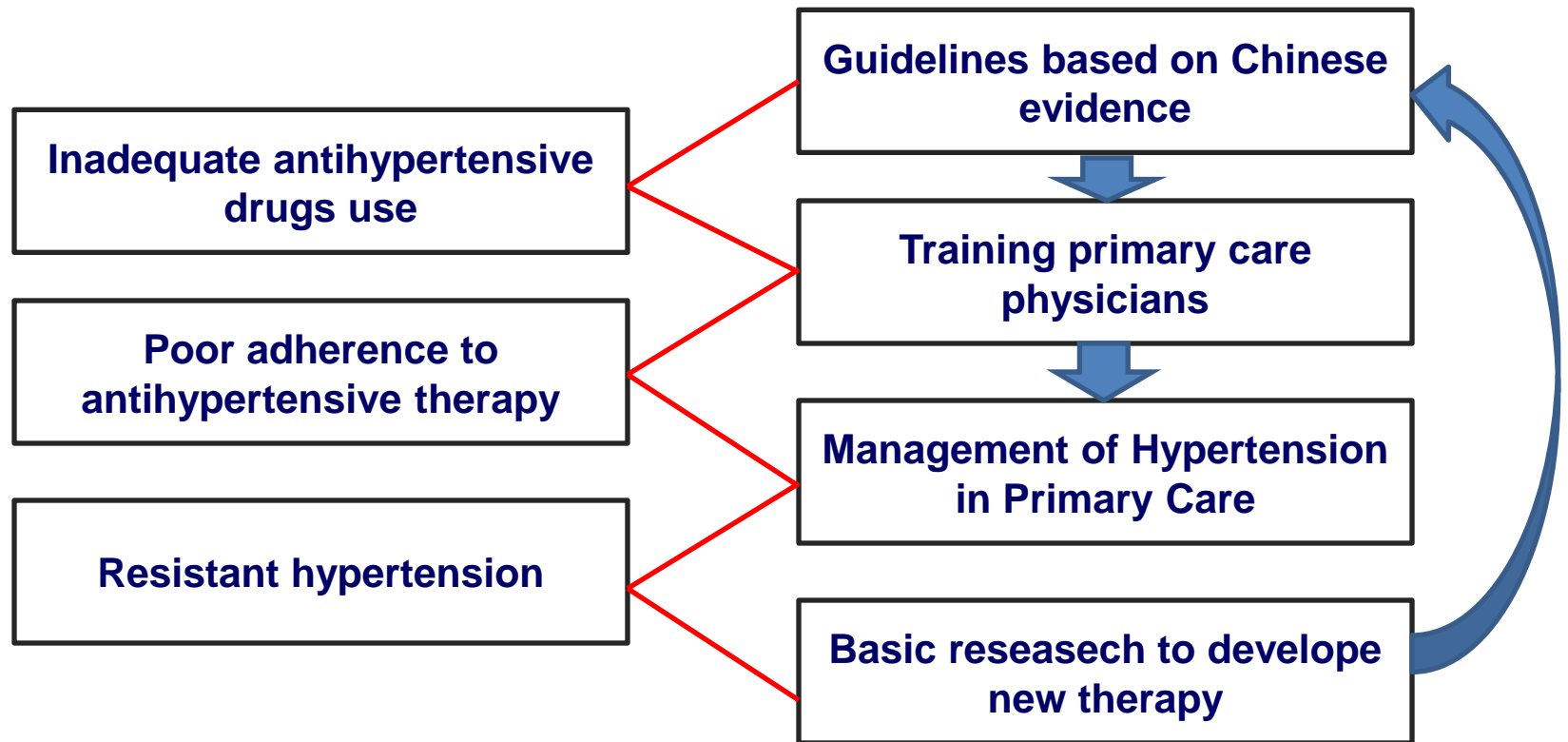
Self-reported adherence to antihypertensive drugs in outpatients with CKD

| | N | % |
|---|-------------|-------------|
| Never miss a dose | 922 | 60 |
| Miss ≤ 1 / month | 418 | 27.2 |
| Miss 1-2 / month | 111 | 7.2 |
| Miss ≥ 3 / week | 85 | 5.5 |
| Total | 1536 | 100 |

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HOW TO IMPROVE HYPERTENSION CONTROL IN CKD?

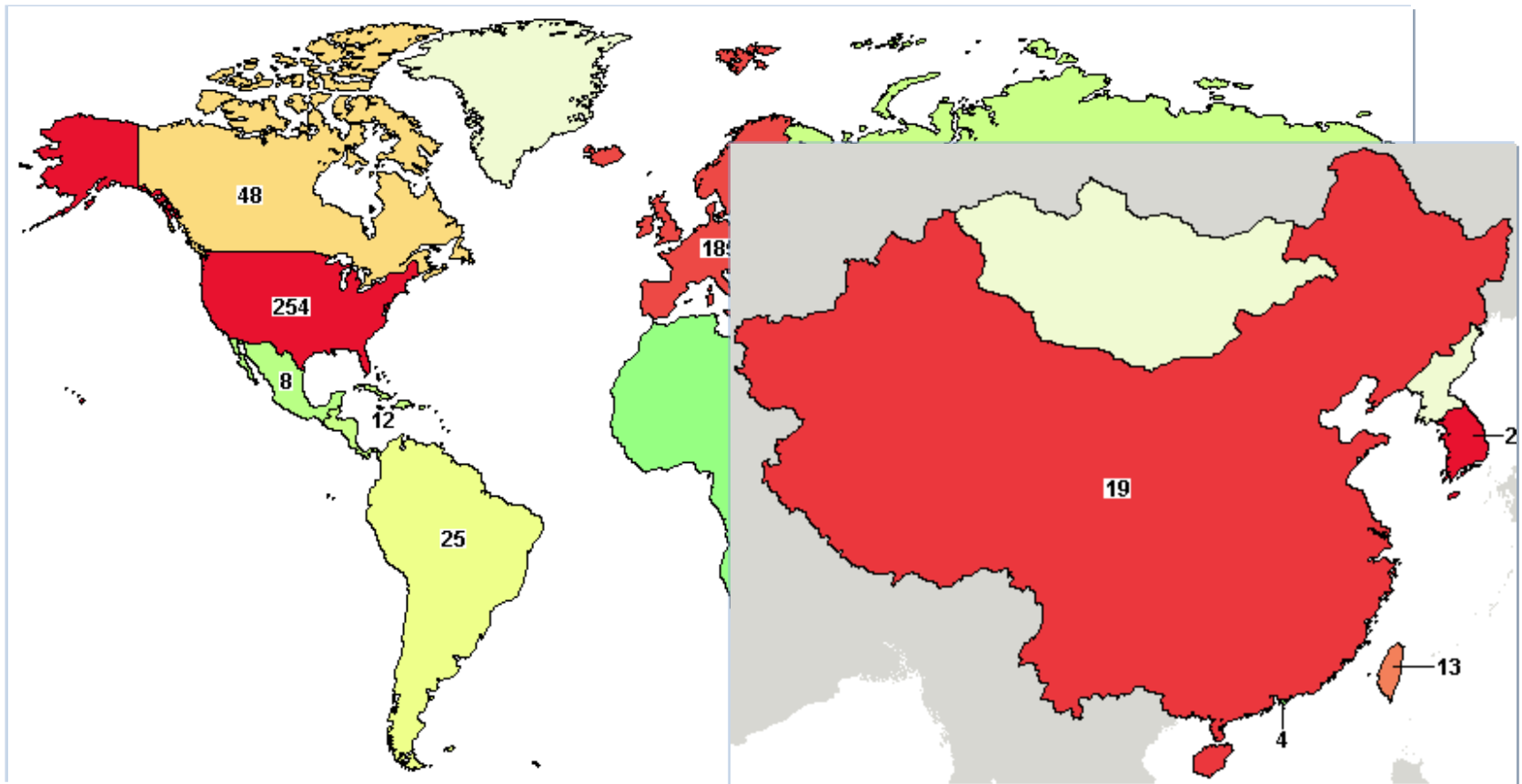


GUIDELINES AND EXPERT CONSENSUS

- ◆ **Expert consensus on long-acting calcium channel blocker use in hypertension in chronic kidney disease patients, 2008**
- ◆ **Expert consensus on renin-angiotensin system blockers use in kidney disease, 2010**
- ◆ **Expert consensus on α/β adrenergic receptor blockers use in hypertension in chronic kidney disease patients, 2013**

CLINICAL TRIALS

615 studies found for: "kidney disease" and "hypertension"



<https://clinicaltrials.gov>
Accessed on Dec. 12, 2015

Colors indicate the number of studies with locations in that region
Least  Most

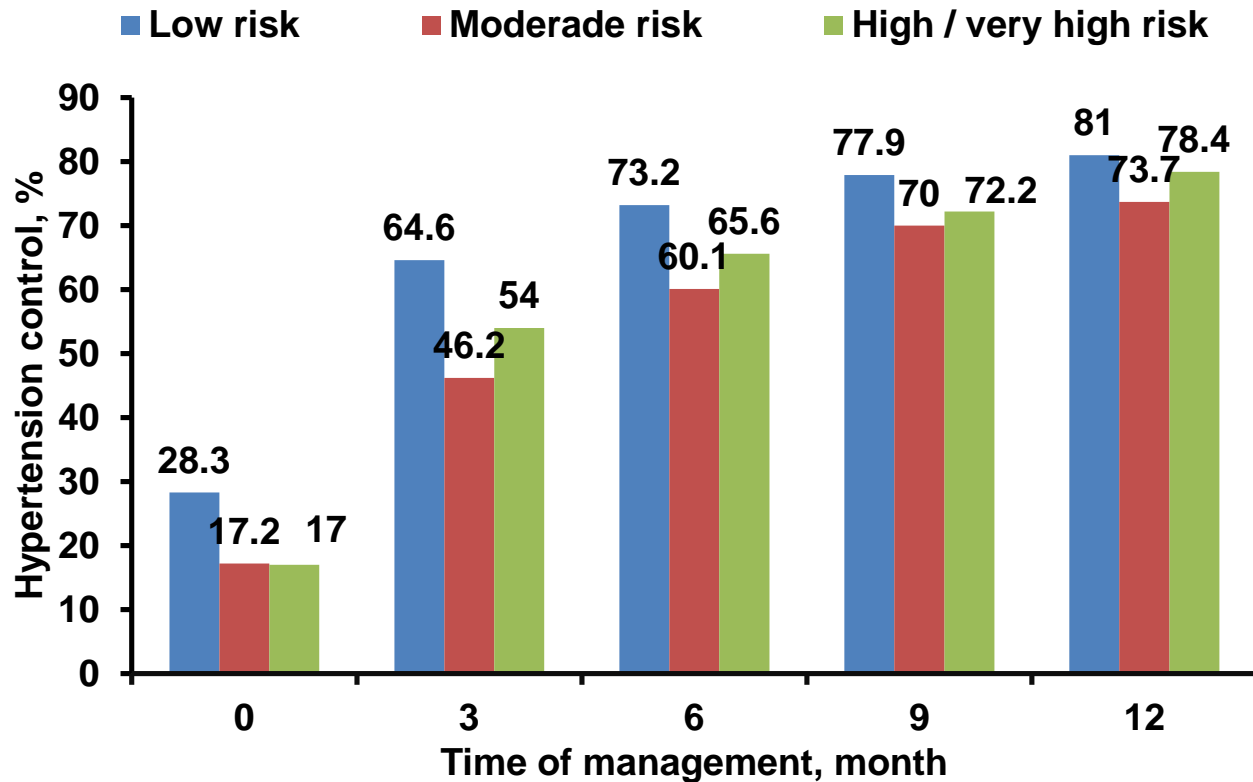
AN EXAMPLE

In 2005, Department of Diseases Prevention and Control, Ministry of Health, launched a program to determine the effects of community-based, standardized hypertension management (n = 29, 411).

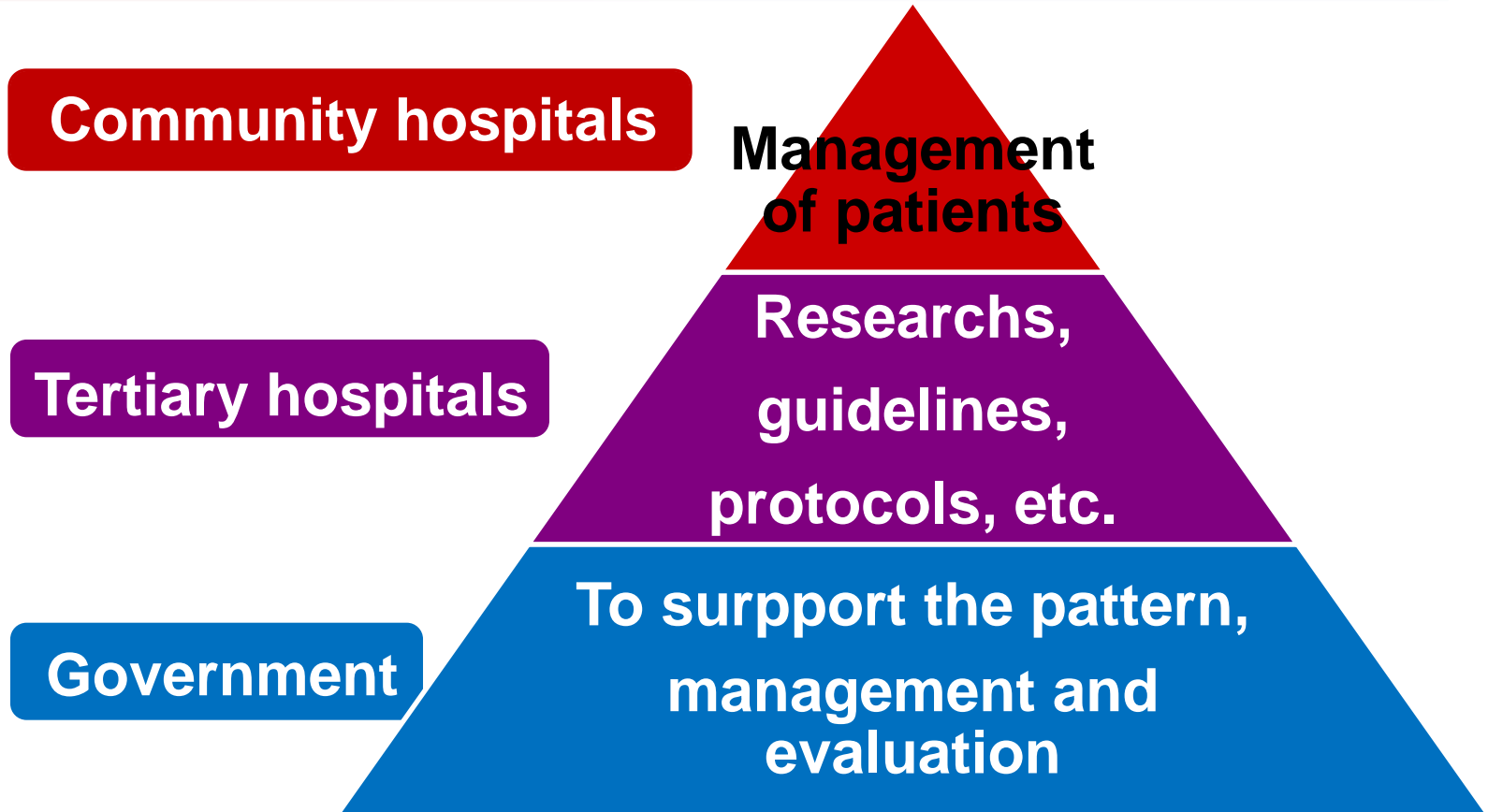
Methods:

- ◆ Training protocol based on “Guidelines for Prevention and Treatment of Hypertension in China, 2005”
- ◆ Training community physicians
- ◆ Managing hypertension by community physicians according to protocol

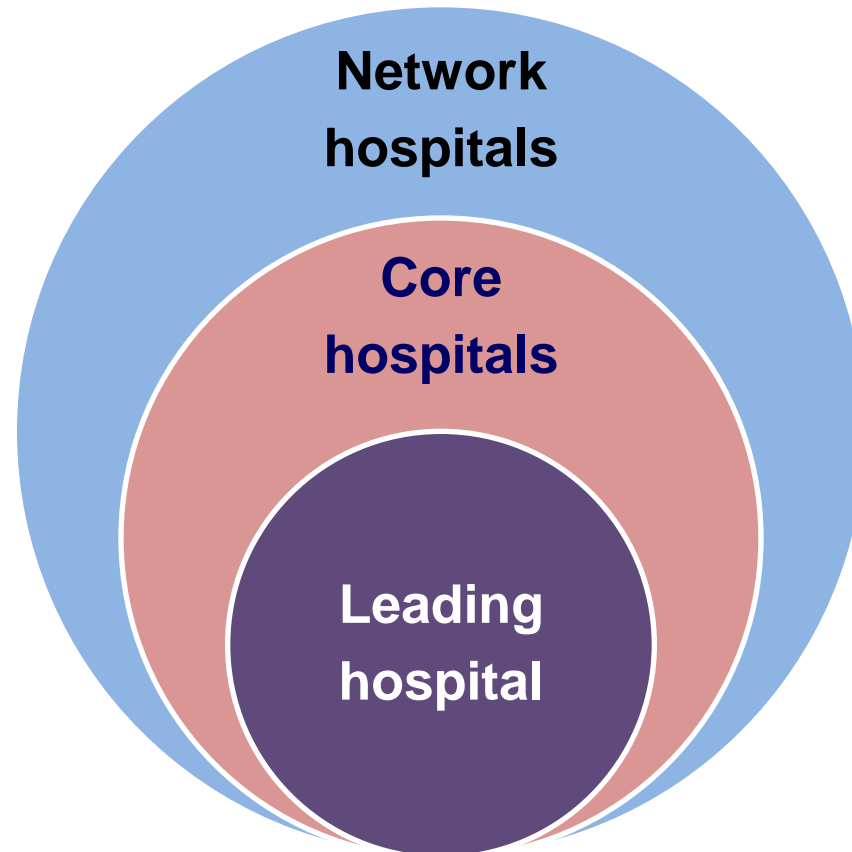
MOST HYPERTENSION CAN BE CONTROLLED



AN IDEAL MANAGEMENT PATTERN



NATIONAL CLINICAL RESEARCH CENTER OF KIDNEY DISEASES, 2013



TRAINING PROGRAM, 2015



ACKNOWLEDGEMENTS

- All participants
- All researchers in 61 hospitals
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**THANKS
FOR
YOUR
ATTENTION**



**WELCOME
TO
BEIJING**

