In the name of God

presenter:
Optometrist **mandana mohammadian**

Accommodative Esotropia:

- Accommodative esotropia is defined as a convergent deviation of the eyes associated with activation of the accommodation reflex. It comprises more than 50% of all childhood esotropias1 and can be classified into 3 forms:
- **(1) refractive**
- **(2) non-refractive**
- **(3) partially accommodative or decompensated.**

All 3 forms possess the following characteristics:

- Onset usually between 6 months and 7 years of age, averaging 2.5 years
- Intermittent at onset, then becoming constant over time
- Often initiated by trauma or illness
- Frequently associated with amblyopia
- May be associated with diplopia in older children, but later disappears as a suppression scotoma develops
- Often has a hereditary basis

Refractive Accommodative Esotropia:

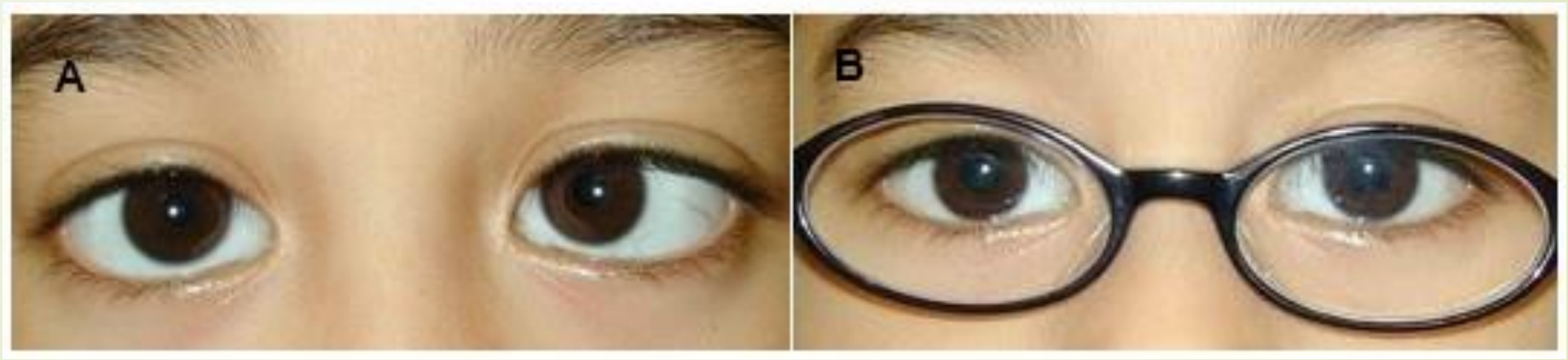
- Pathophysiology:
- (1) uncorrected hyperopia
- (2) accommodative convergence,
- (3) poor fusional divergence

Clinical features:

- Refractive accommodative esotropia usually occurs after a history of acquired intermittent or constant esotropia. Although this usually occurs in a child between 2 and 3 years of age, children younger than 1 year may sometimes present with all the features of refractive accommodative esotropia.

Treatment:

- Hyperopic correction
- **The mainstay of treatment is spectacle correction in refractive accommodative esotropia. The full hyperopic correction based on the cycloplegic refraction is initially prescribed**



Two important points of parental counseling are pertinent:

Glasses must be worn on a full-time basis. With part-time use of glasses, the child's accommodation is never fully relaxed, and vision is blurred whenever the child intermittently returns to using the hyperopic glasses.

After initiation of spectacle correction, the esotropia will increase when the child is not wearing glasses. Parents often blame the increased esodeviation on initiation of glasses, and thus appropriate counseling is important prior to treatment. This is because after initiation of full-time glasses use, the child becomes accustomed to a much-reduced accommodative effort. However, when the glasses are removed, the child will need to increase accommodative effort to a greater extent than before glasses were prescribed, which will lead to an increased angle of esotropia.

Refractive Surgery:

- In 1997, Bilgihan reported the first case of a 19-year-old male who was treated with photorefractive keratectomy (PRK) for refractive accommodative esotropia.15 Since then, several authors have investigated the role of PRK and laser in situ keratomileusis (LASIK) for this condition

Non-Refractive Accommodative Esotropia:

- A subgroup of patients with accommodative esotropia have significantly larger esotropia at near, that is, non-refractive or high accommodative convergence (AC:A) ratio accommodative esotropia.
- **Pathophysiology:**
- The mechanism involves a high AC:A ratio, whereby accommodative effort results in an abnormally high convergence response. Because more accommodation occurs at near, the excess convergence tonus is more manifest at near, so the near esodeviation is larger than that for distance.

Clinical features:

- Children with high AC:A ratio accommodative esotropia usually present between 2 and 3 years of age. The refractive error in this condition may be hyperopic, emmetropic, or myopic. The average refractive error is +2.25 D.

- Measurement of the near angle with accommodative targets is important to demonstrate the full esodeviation. A normal AC:A ratio is 3 to 5 prism diopters: 1 diopter. There are several methods of measuring the AC:A ratio: the heterophoria20 and gradient21 methods, and clinical evaluation of distance and near deviation. The methods of measurement for the heterophoria and gradient methods are as follows:

A. Perform prism cover test (PCT) at near, with the patient wearing the necessary refractive correction

B. Perform PCT at near, with the patient wearing the necessary refractive correction, and with additional +3.00DS convex lens

$$\text{AC:A Ratio} = \frac{(A\text{-}B)}{3}$$

$$\text{AC:A Ratio} = \text{Interpupillary Distance (cm)} + \frac{(\text{Near PCT PD} - \text{Distance PCT PD})}{3}$$

Distance-near Comparison:

- Most clinicians prefer to use the distance-near comparison, since this allows the ratio to be evaluated quickly and easily, and it is based on routine examination techniques in the clinic without need for calculations. The AC:A ratio is determined based on the distance and near measurements, whereby if the near esotropia is greater than 10 prism diopters, the AC:A ratio is considered high.

Treatment:

- **Observation**
- Bifocal
- Miotic agents
- Surgery

Partial or Decompensated Accommodative Esotropia:

- Refractive or non-refractive accommodative esotropias do not always show a reduction in their esodeviations with glasses but have a residual esotropia in spite of full hyperopic correction. These cases have partially accommodative esotropia. Partially accommodative esotropia may also refer to an esotropia that was initially fully accommodative, but that subsequently decompensated over time.3

Treatment:

- The initial treatment of partially accommodative esotropia is correction of the full hyperopic error. If after prescribing the full spectacle correction for 4 to 6 weeks, there is residual esotropia of more than 10 prism diopters for distance and near, and the patient is not attaining fusion, there is a general indication for surgery.

Standard surgery:

- The standard surgical approach has been to operate for the residual deviation with full hyperopic correction for distance. In high AC:A ratio cases where the near deviation is greater than the distance deviation, operation on the near deviation is acceptable. However, standard surgery has an unacceptably high undercorrection rate of about 25%, and other surgical approaches have been considered.

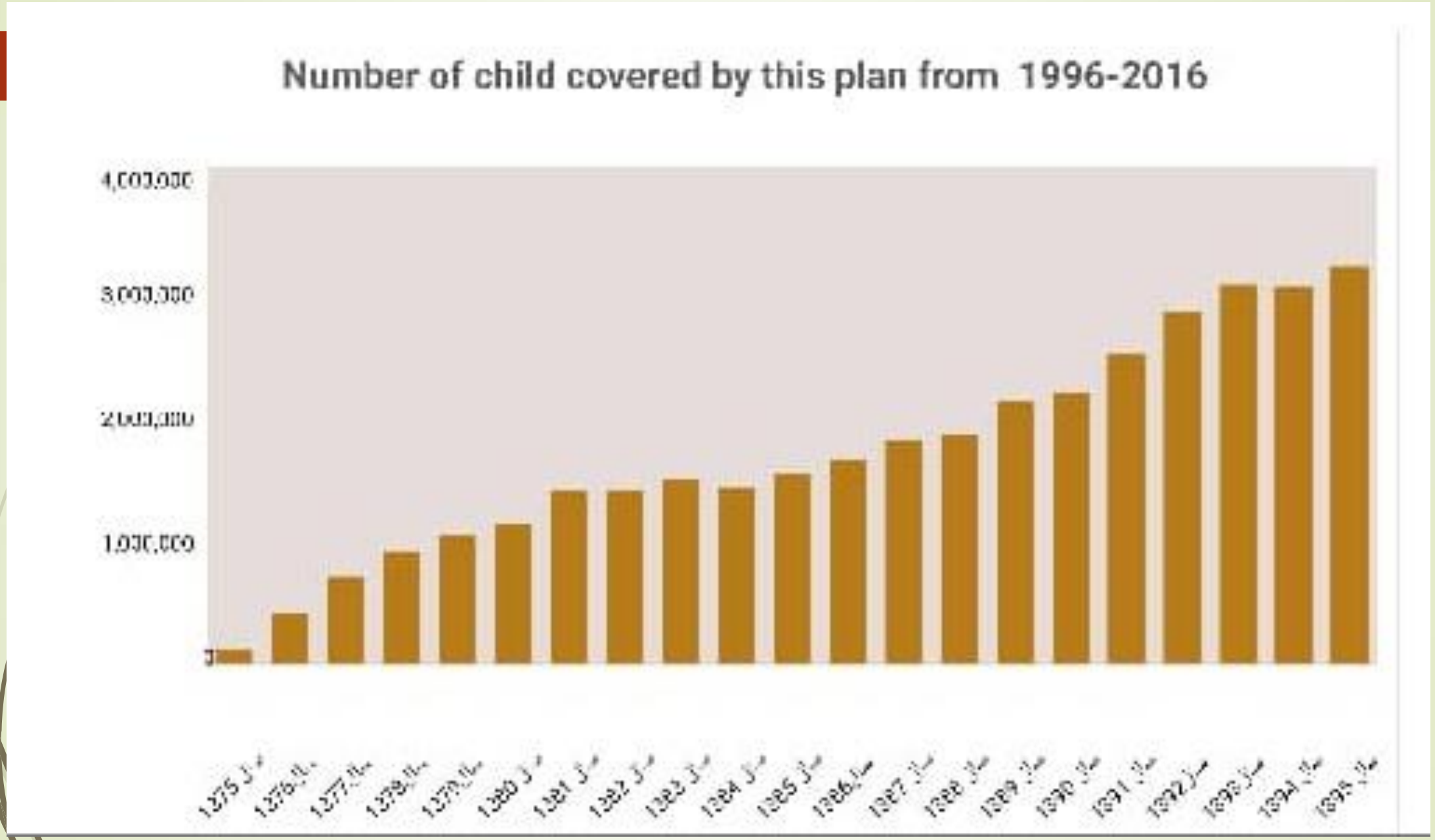
Prism adaptation:

- Another method involves the use of prism adaptation, which involves prescribing base-out prisms for residual esotropia after full hyperopic correction. The patient then returns in 2 weeks and if the esotropia has increased, a larger prism is given. This process continues at 1- to 2-weekly intervals until the deviation has stabilized. The surgeon then operates on the full "prism-adapted" angle
- The Prism Adaptation trial,34 a large multicenter study on prism adaptation, showed that standard surgery resulted in an approximately 75% success rate, compared to 85% with the prism-adapted angle. Prism adaptation has the disadvantages of being more costly and requiring more time.


A

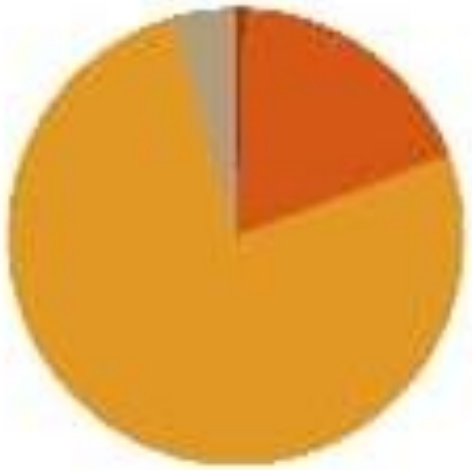

B

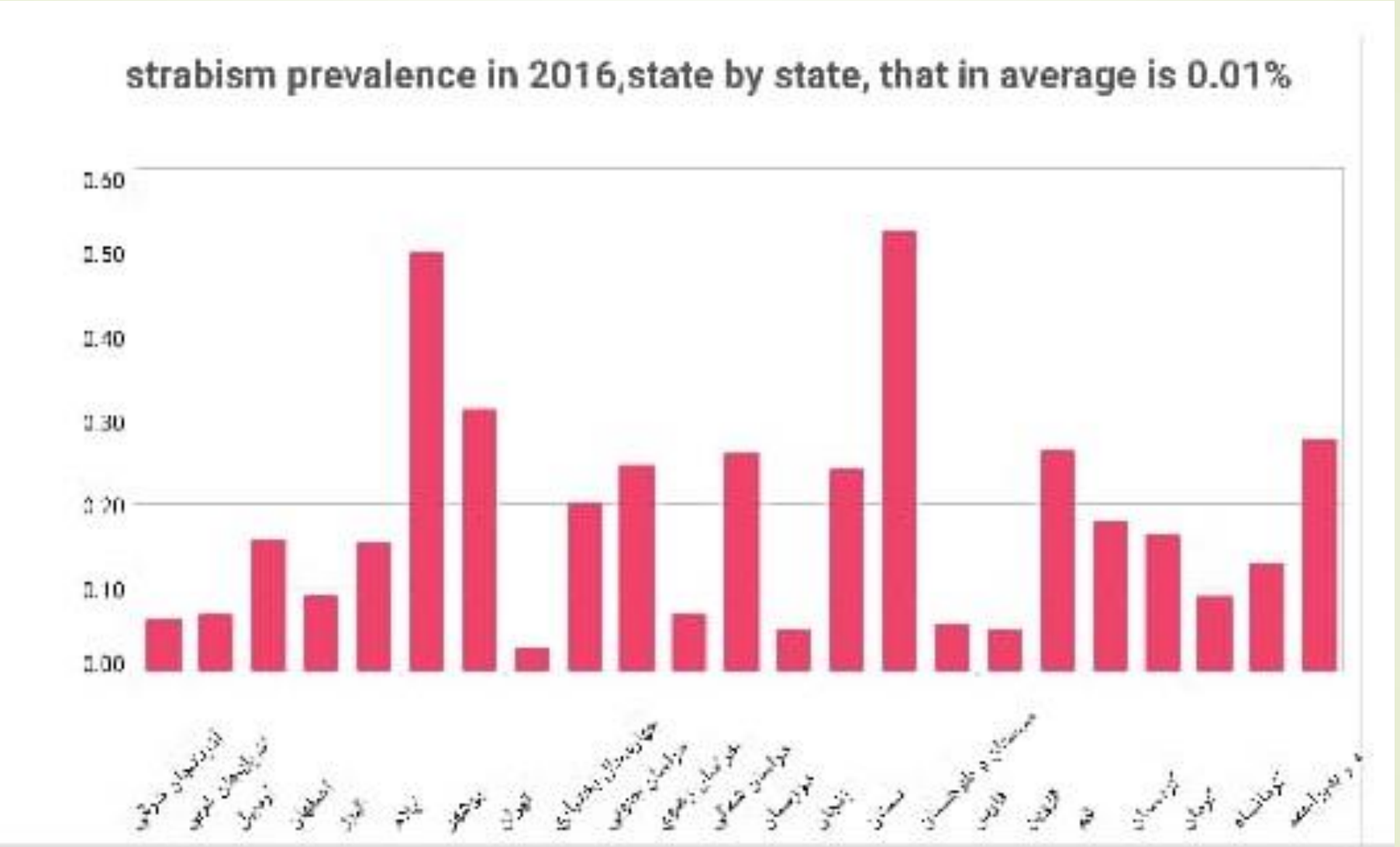

C

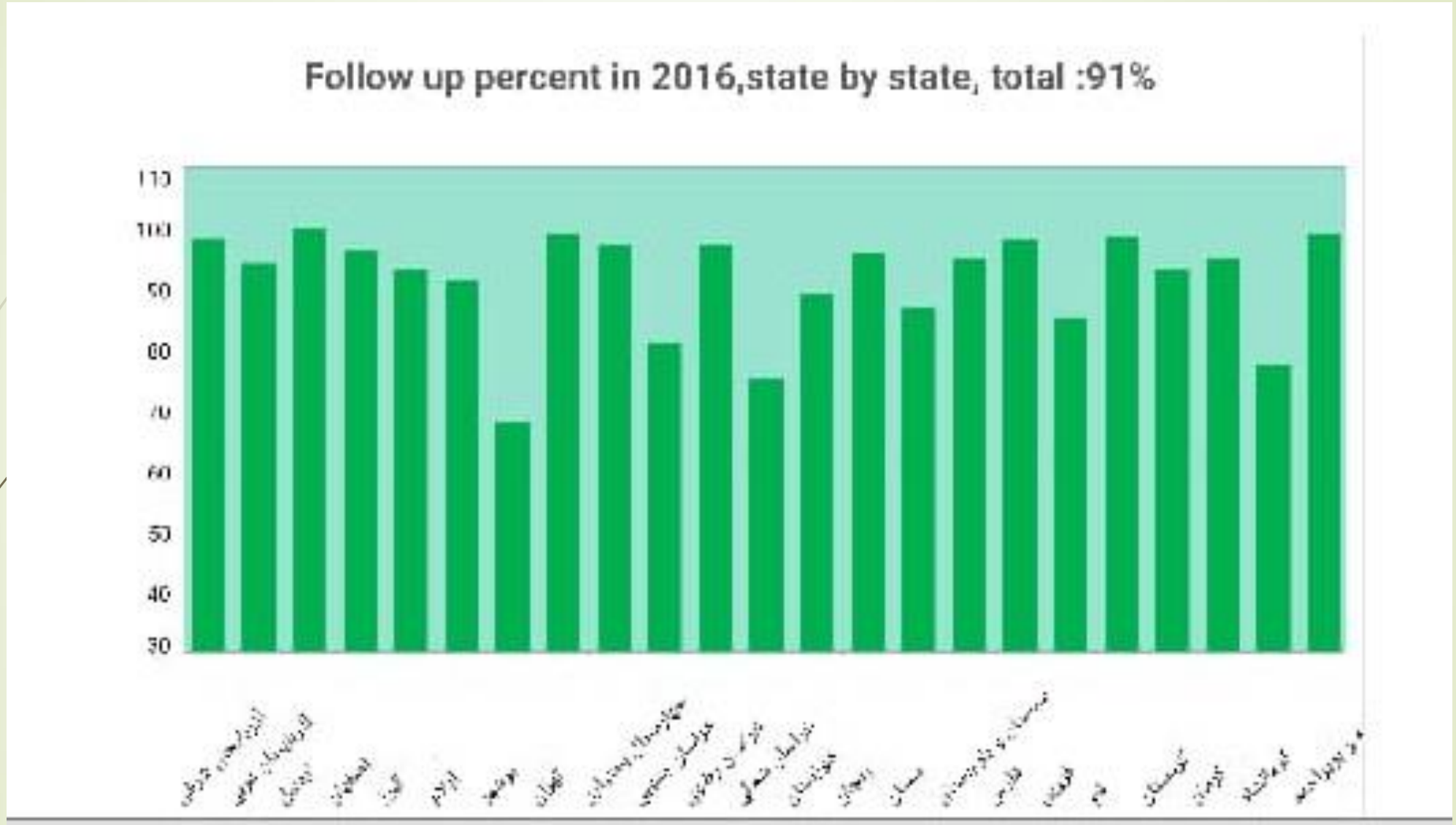

Number of child covered by this plan from 1996-2016

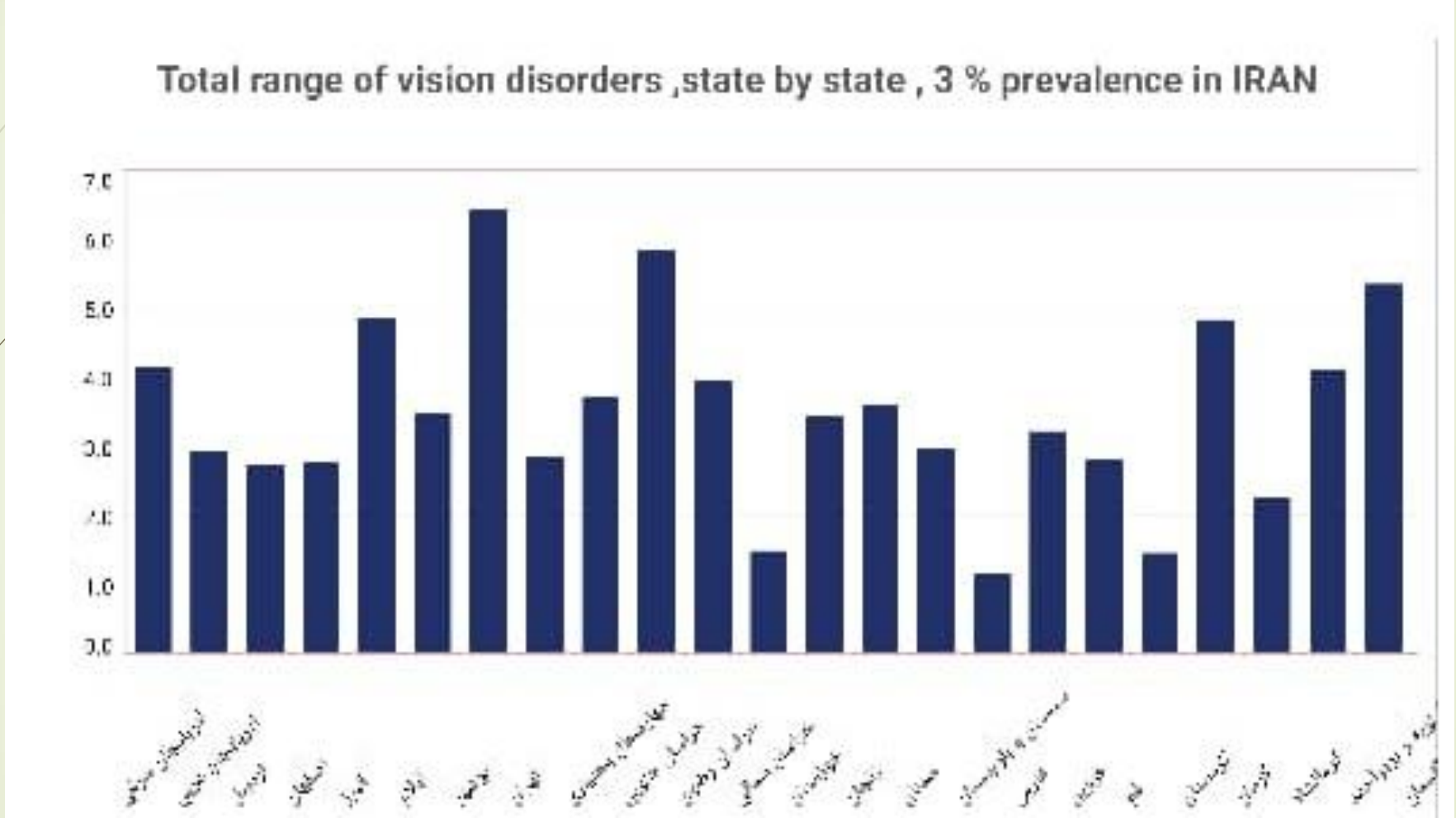
3-ophthalmologist

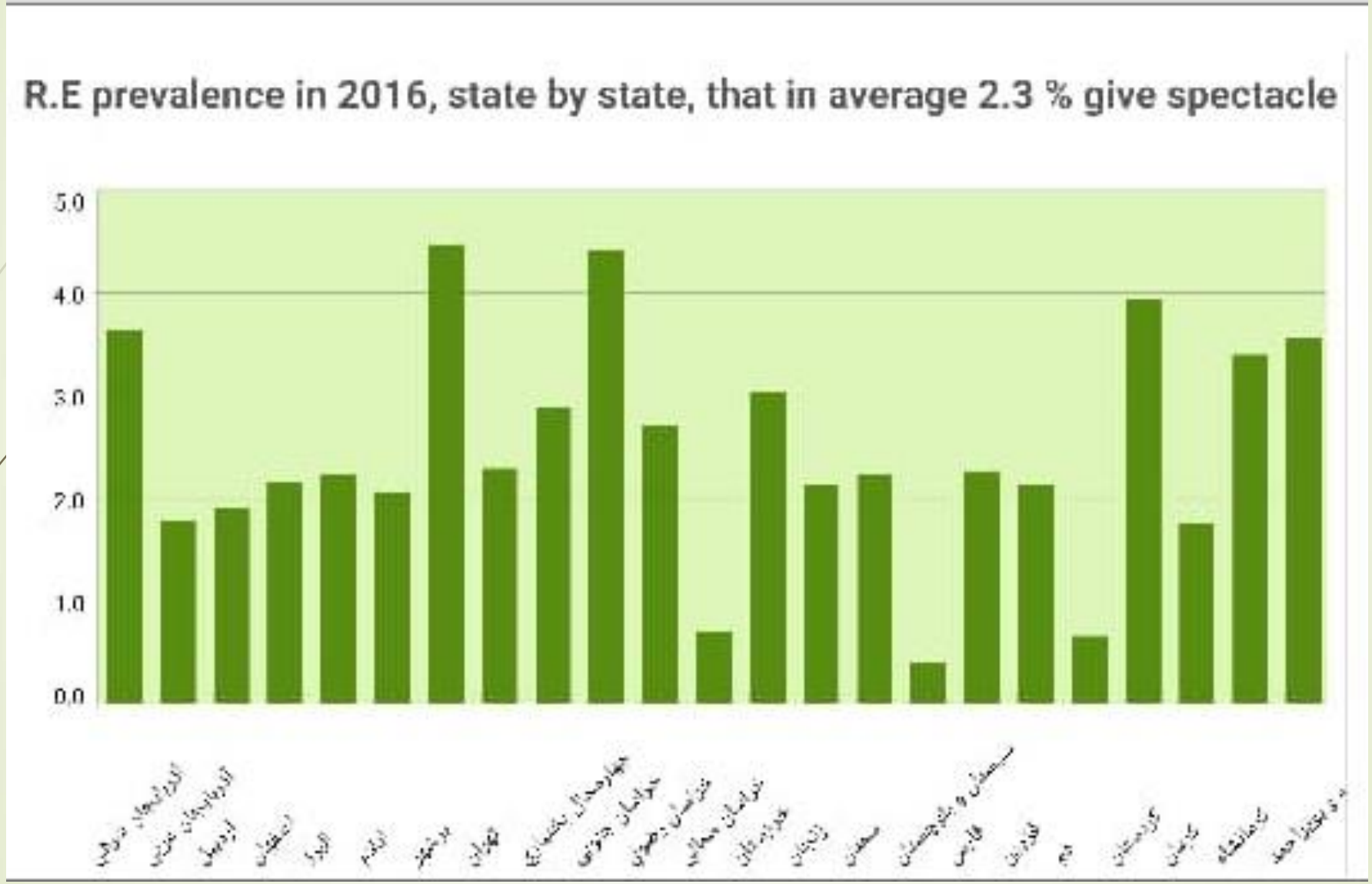
- Because of very low refer for pathological problems to ophthalmologists there is no independent graph for this section of amblyopia prevention program.(about 4 % of abnormal cases)

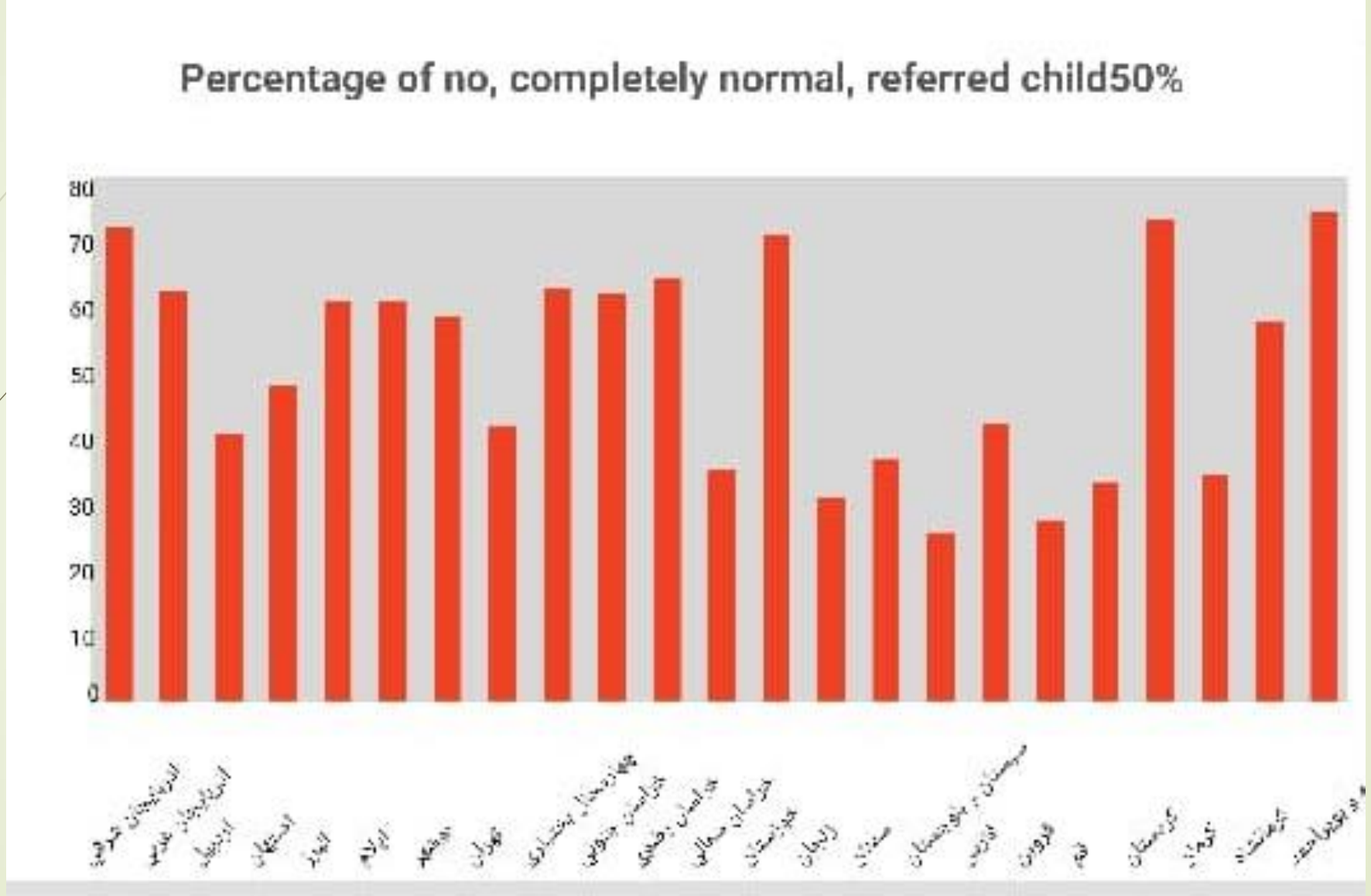


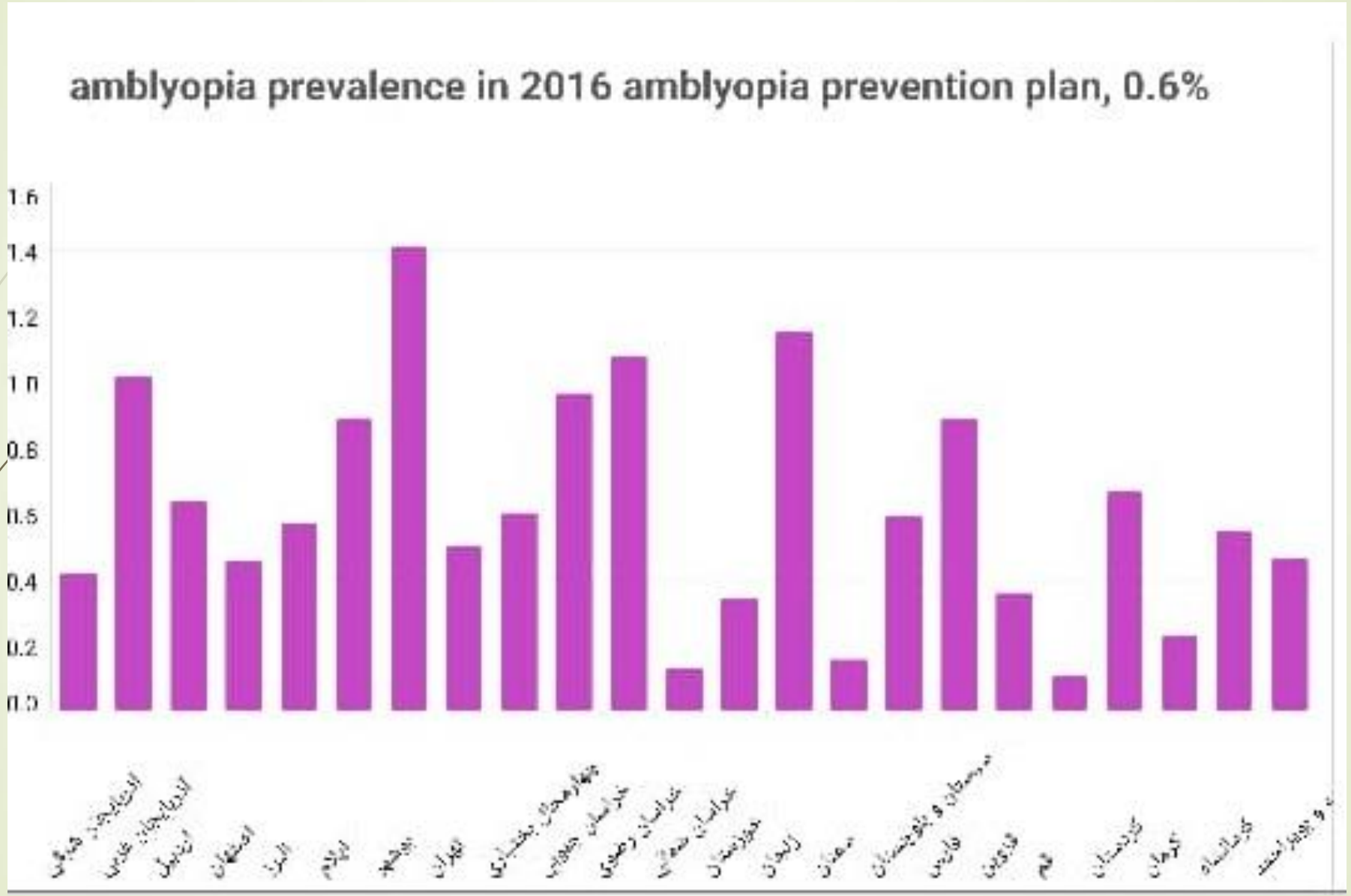

strabism prevalence in 2016,state by state, that in average is 0.01%
0.50
0.40
0.30
0.10
0.00

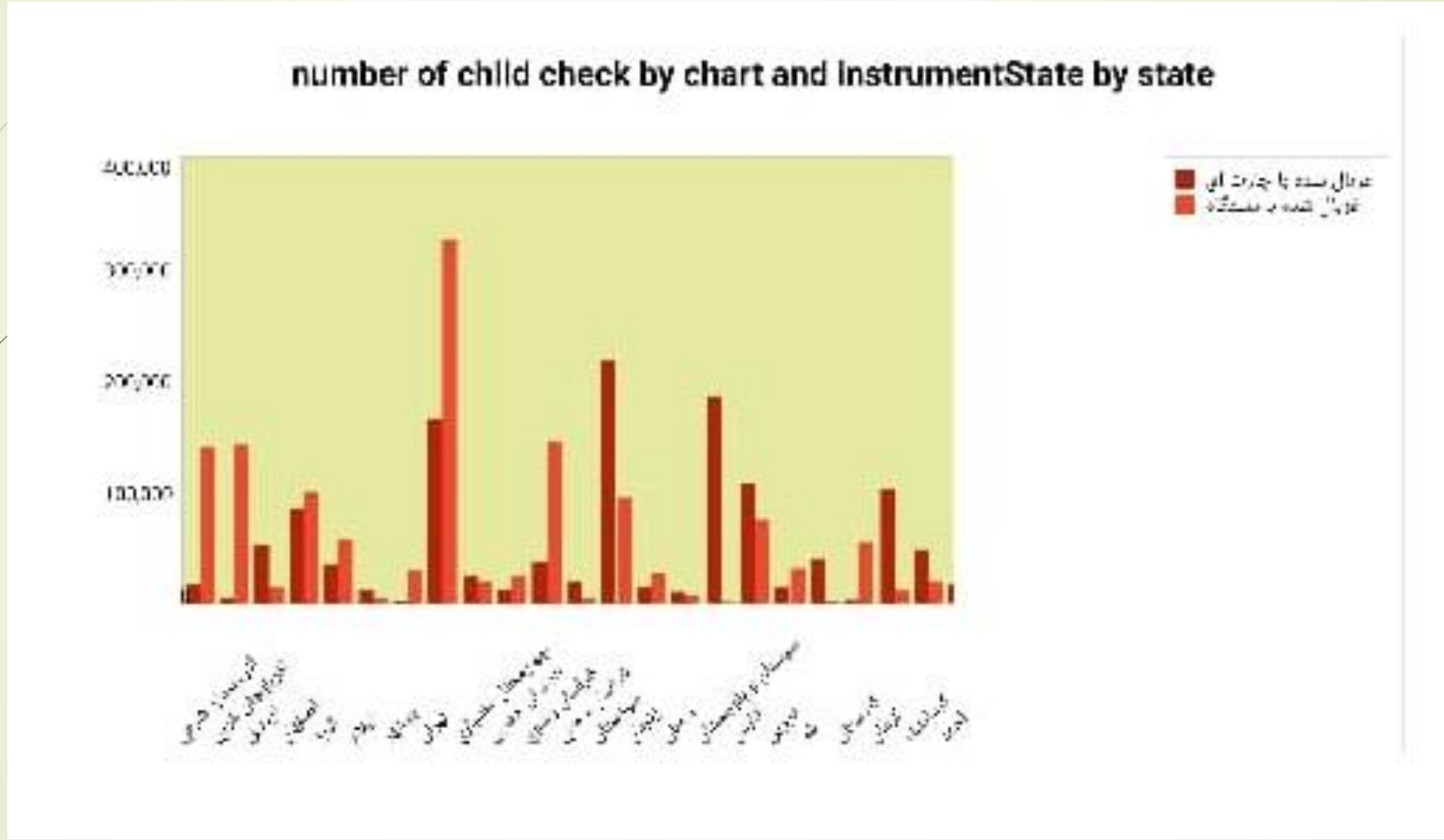

Follow up percent in 2016,state by state, total :91%
110
100
90
80
70
60
50
40
30

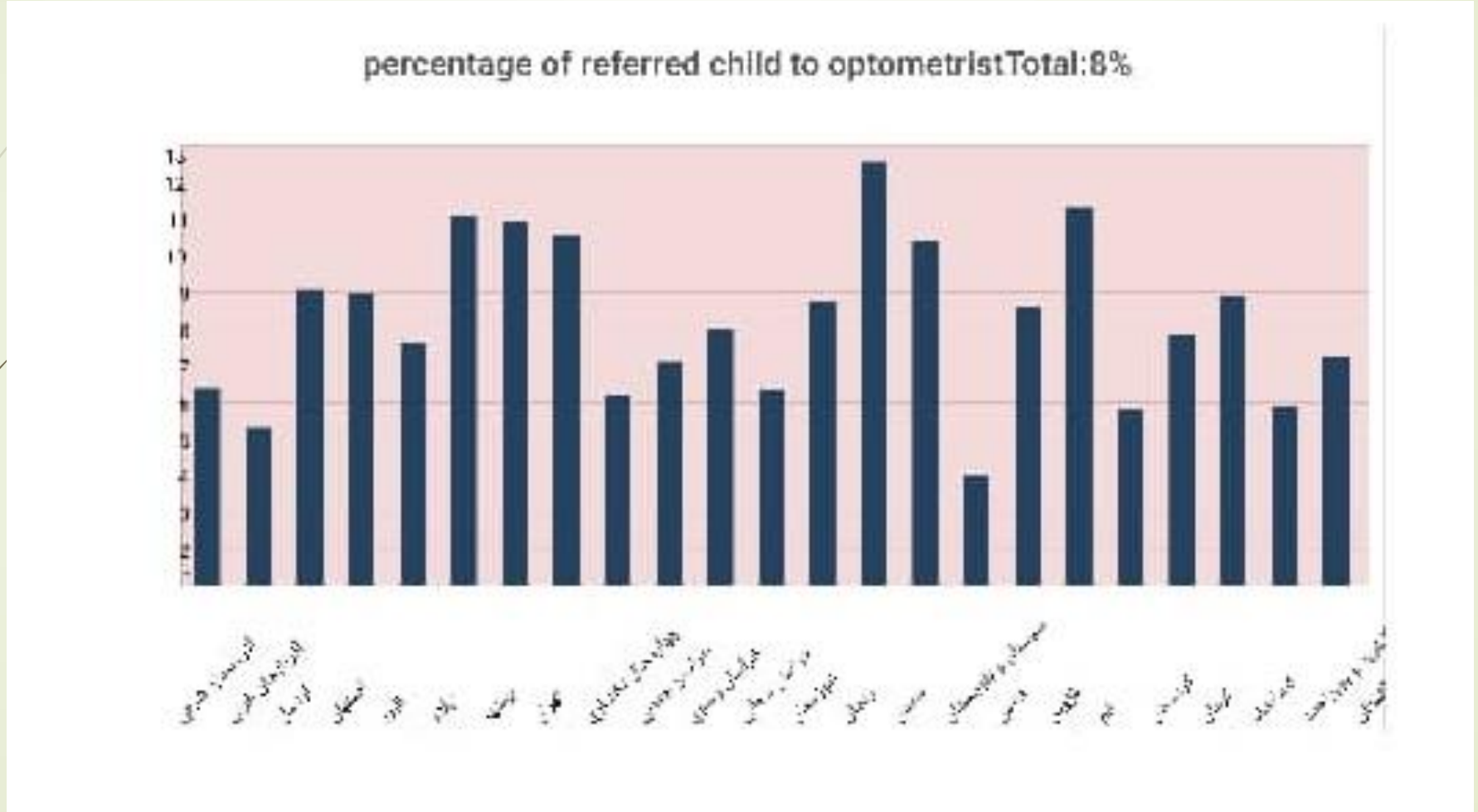

Total range of vision disorders ,state by state , 3 % prevalence in IRAN
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0

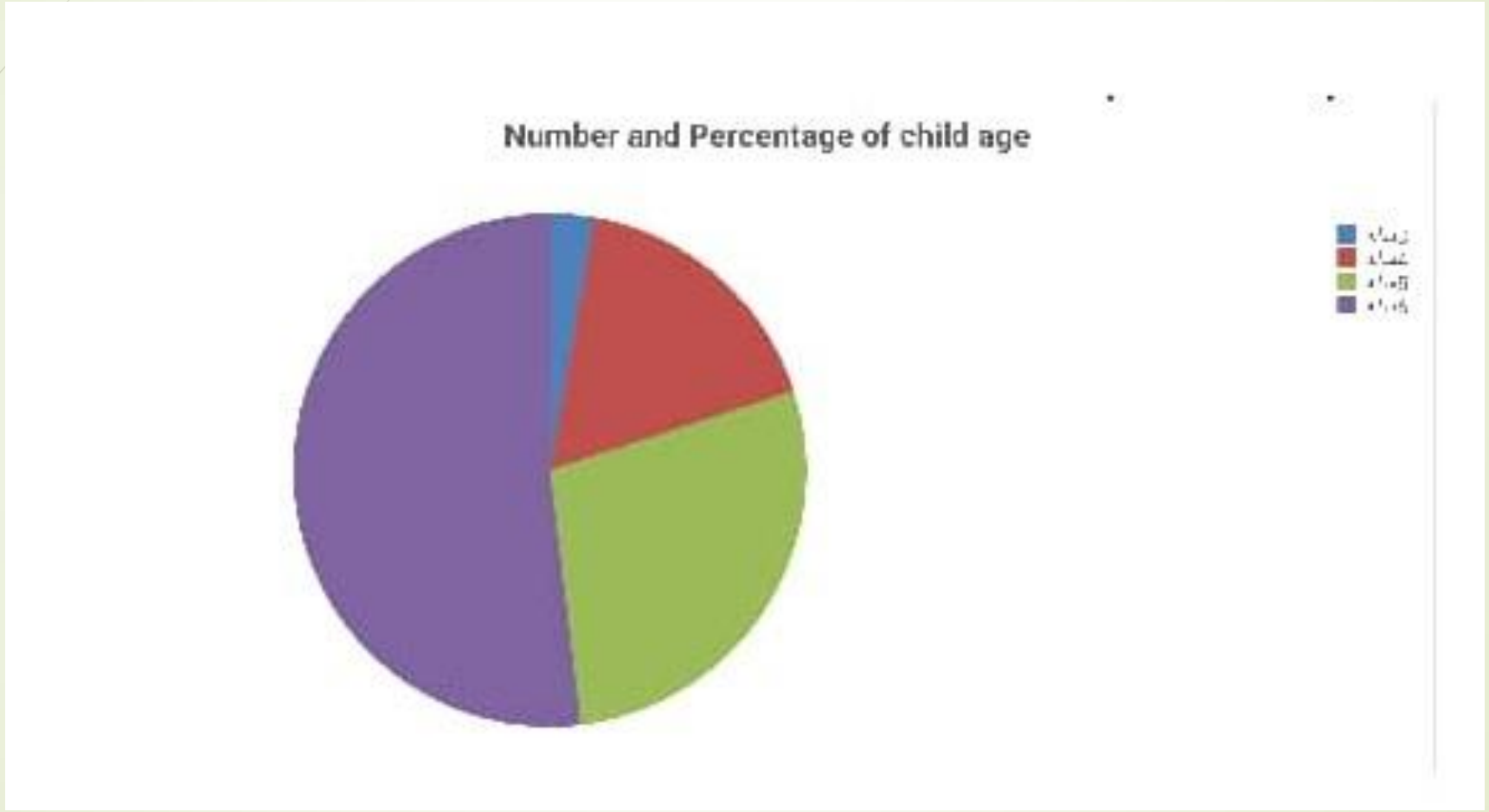

R.E prevalence in 2016, state by state, that in average 2.3 % give spectacle
5.0
4.0
3.0
2.0
1.0
0.0

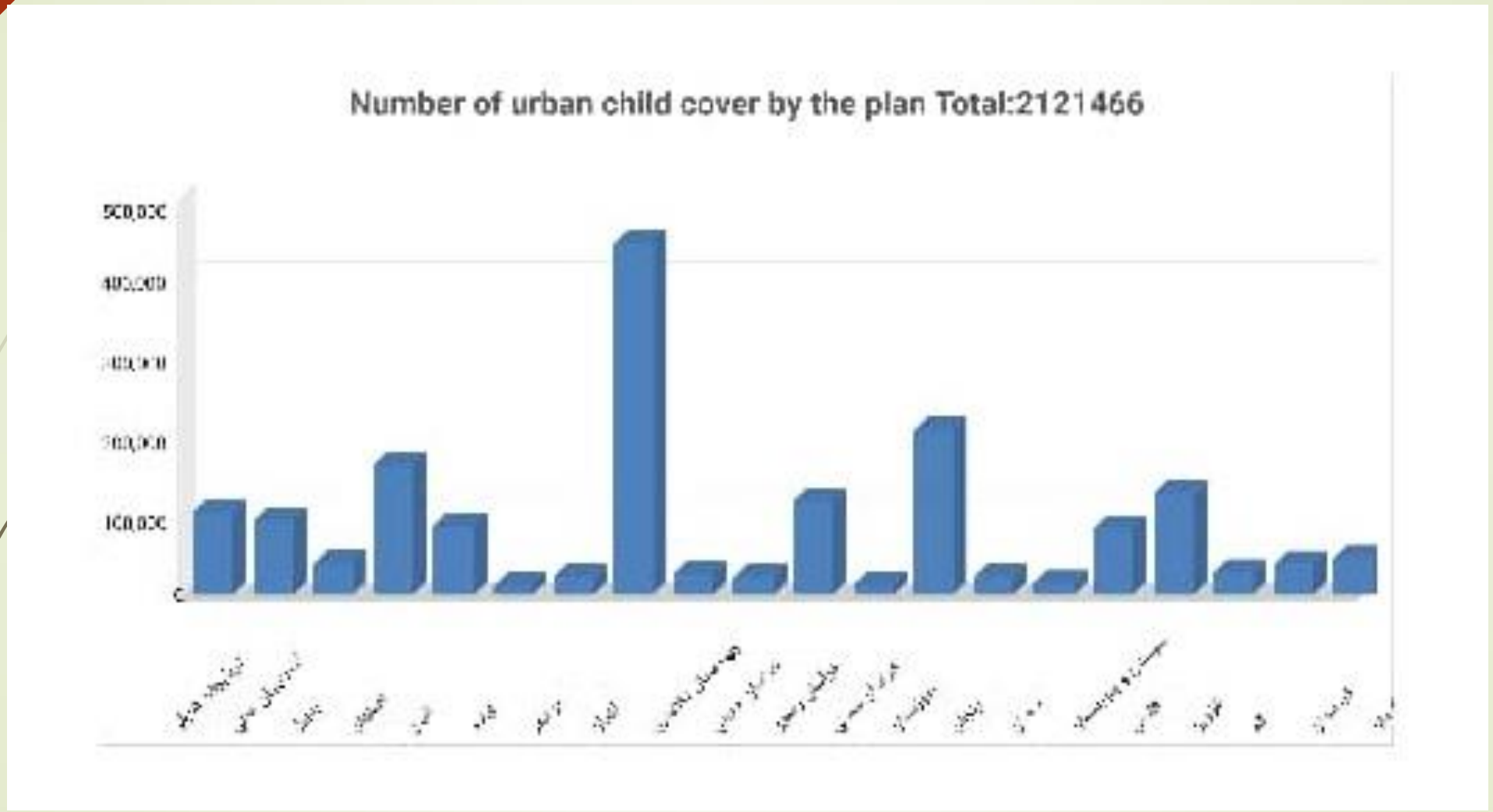

Percentage of no, completely normal, referred child50%
80
70
60
50
40
30
20
10
0

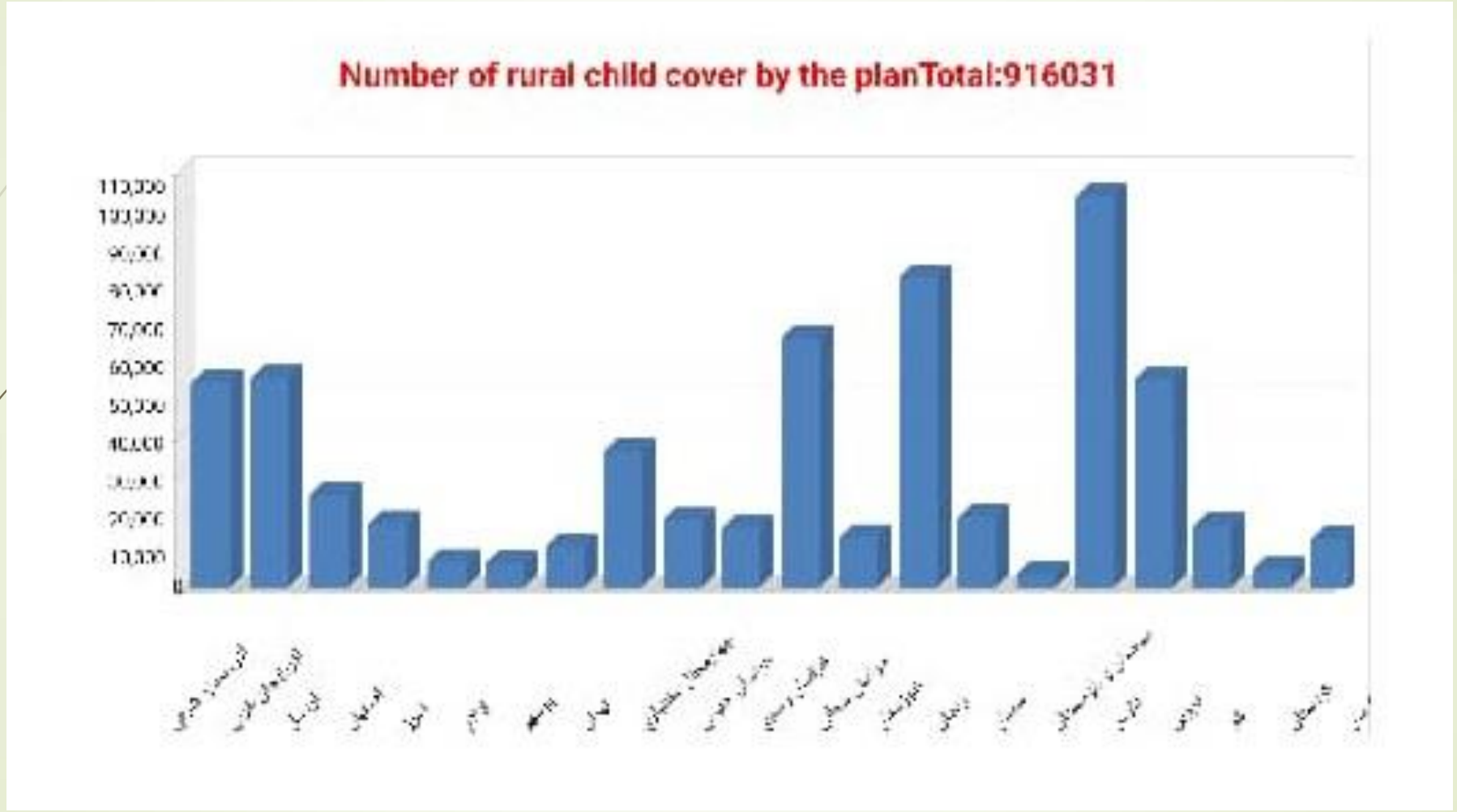

amblyopia prevalence in 2016 amblyopia prevention plan, 0.6%
1.6
1.4
1.2
0.6
0.5
0.4
0.2

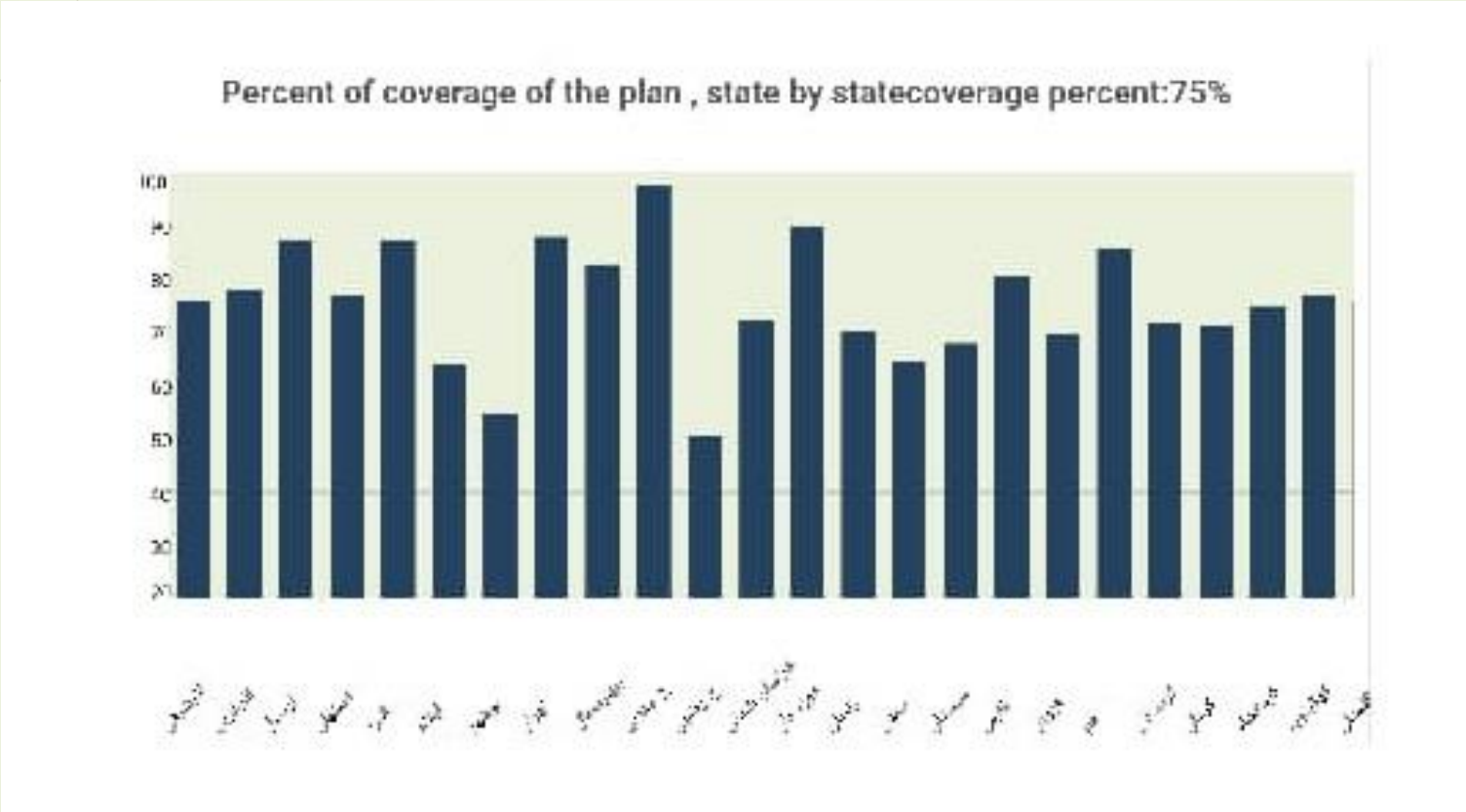

number of child check by chart and InstrumentState by state

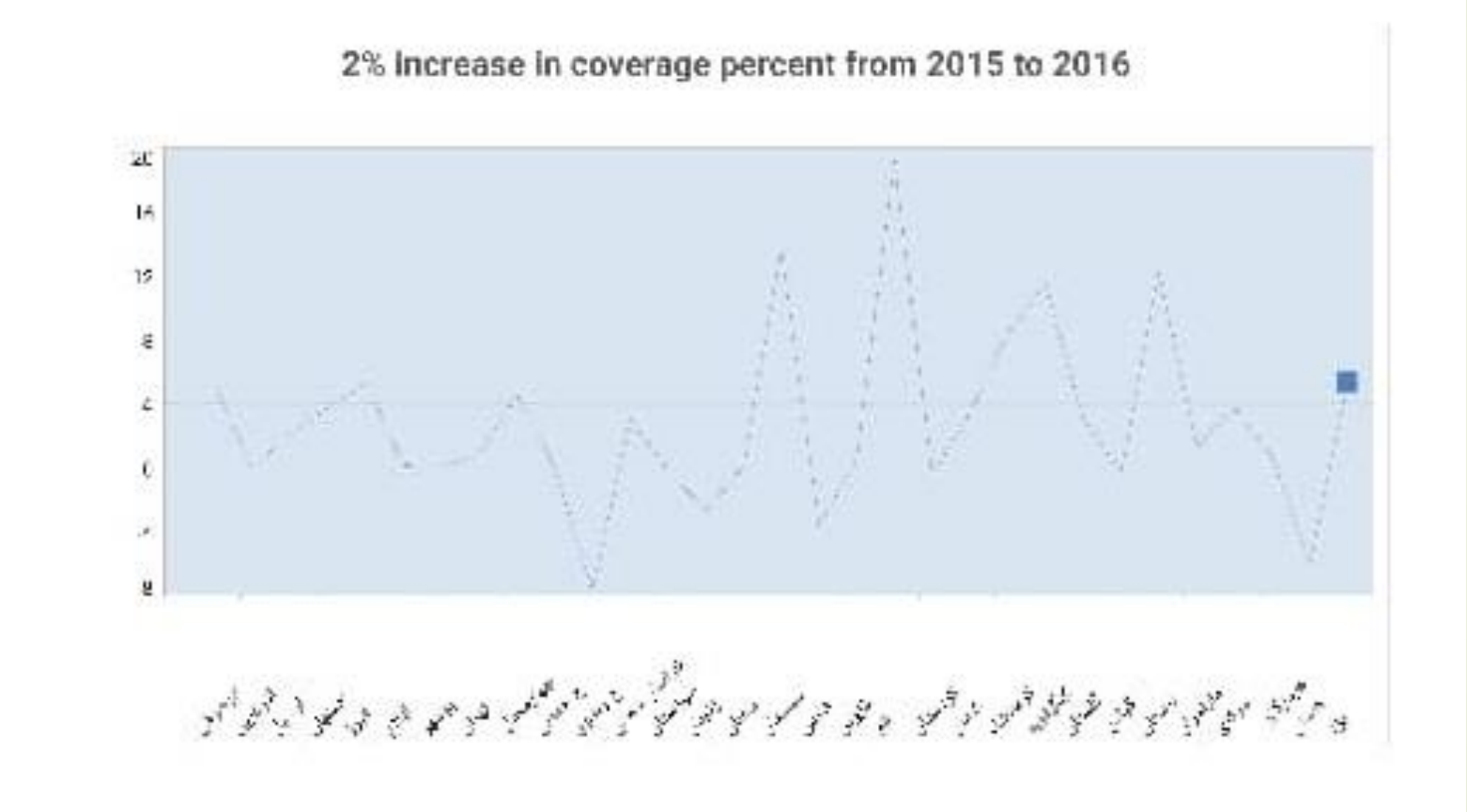

percentage of referred child to optometristTotal:8%

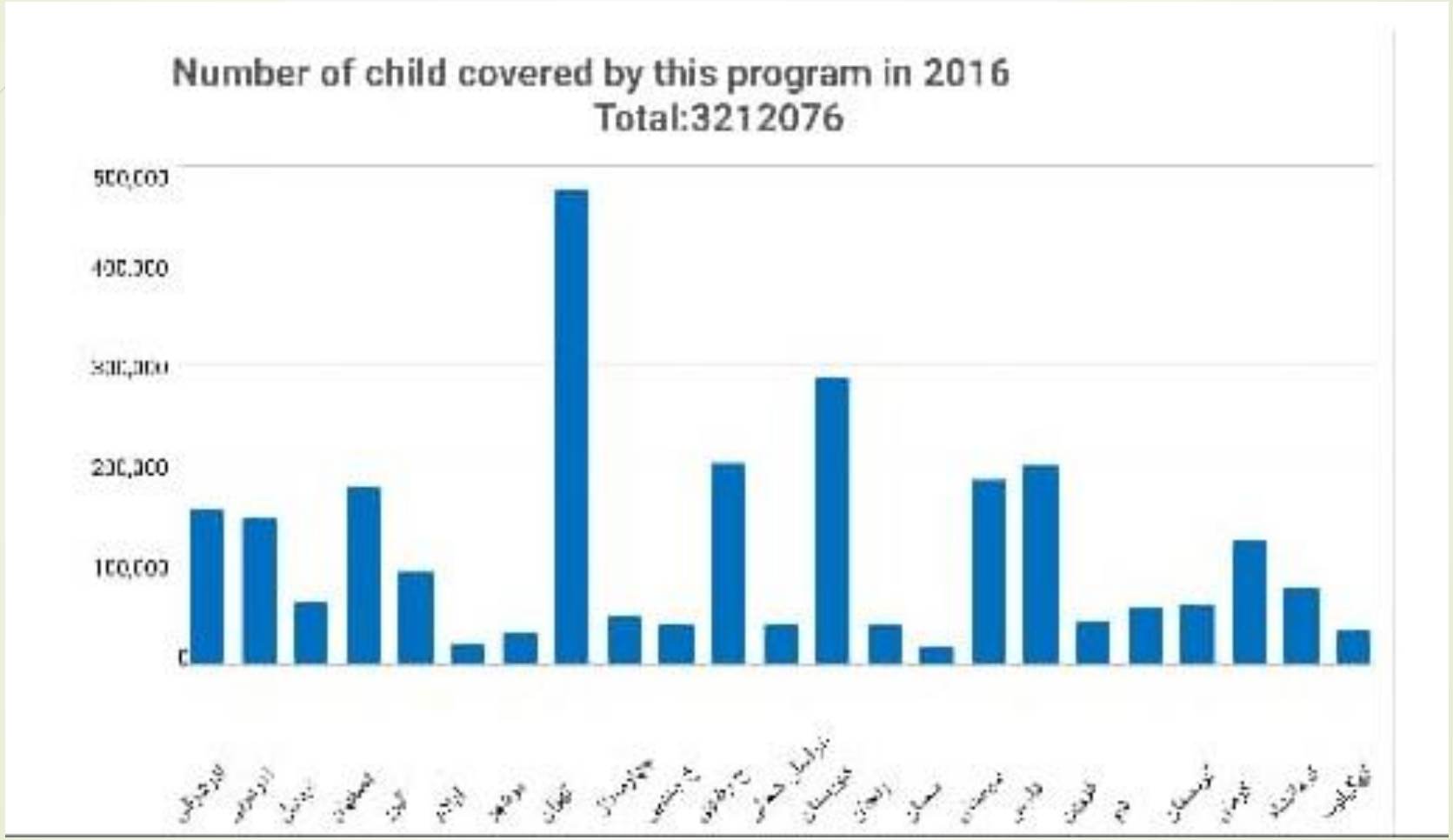

Number and Percentage of child age


Number of urban child cover by the plan Total:2121466


Number of rural child cover by the planTotal:916031

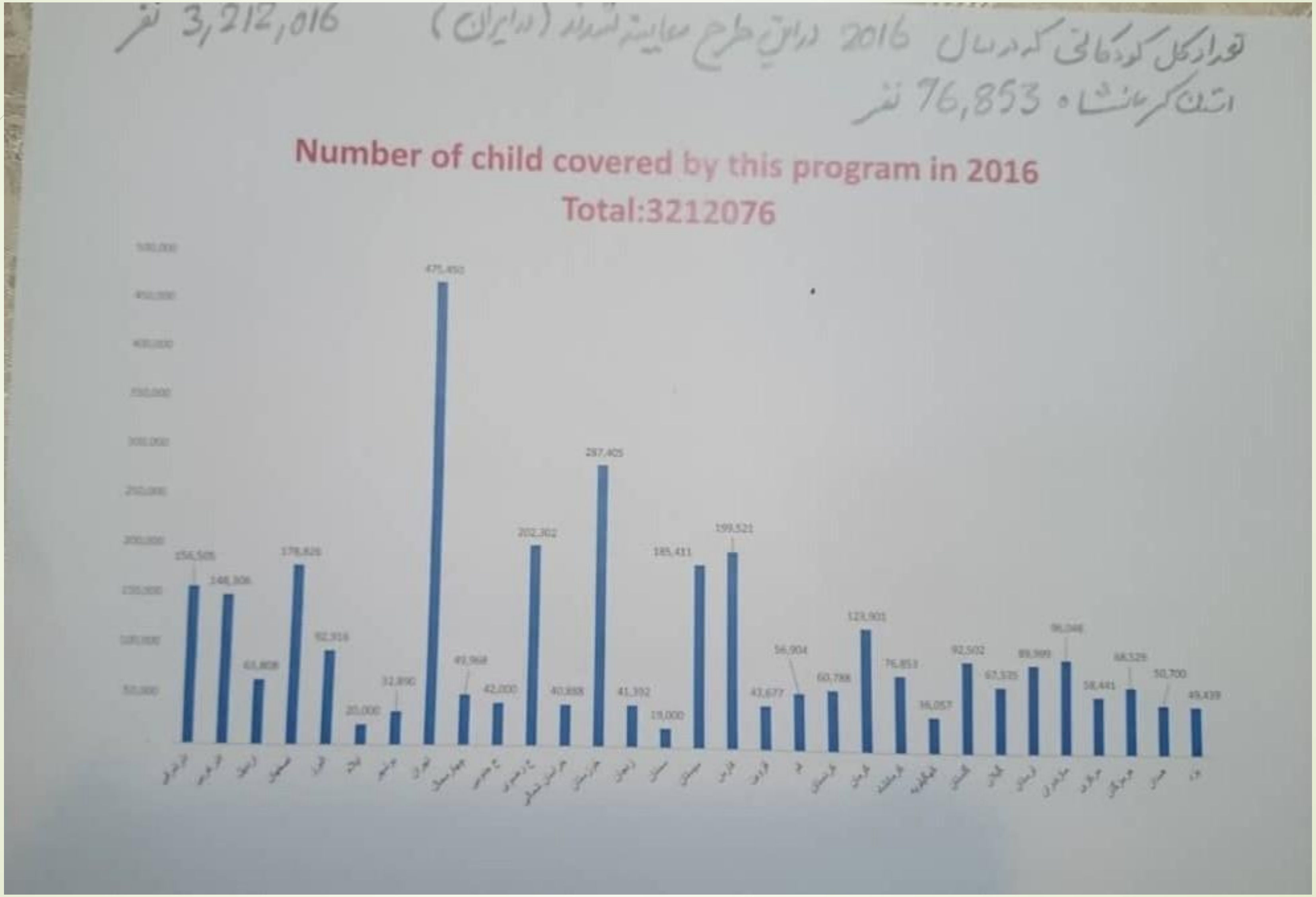

Percent of coverage of the plan , state by statecoverage percent:75%


2% Increase in coverage percent from 2015 to 2016


Number of child covered by this program in 2016
Total:3212076
500,000
400,000
300,000
200,000
100,000
0

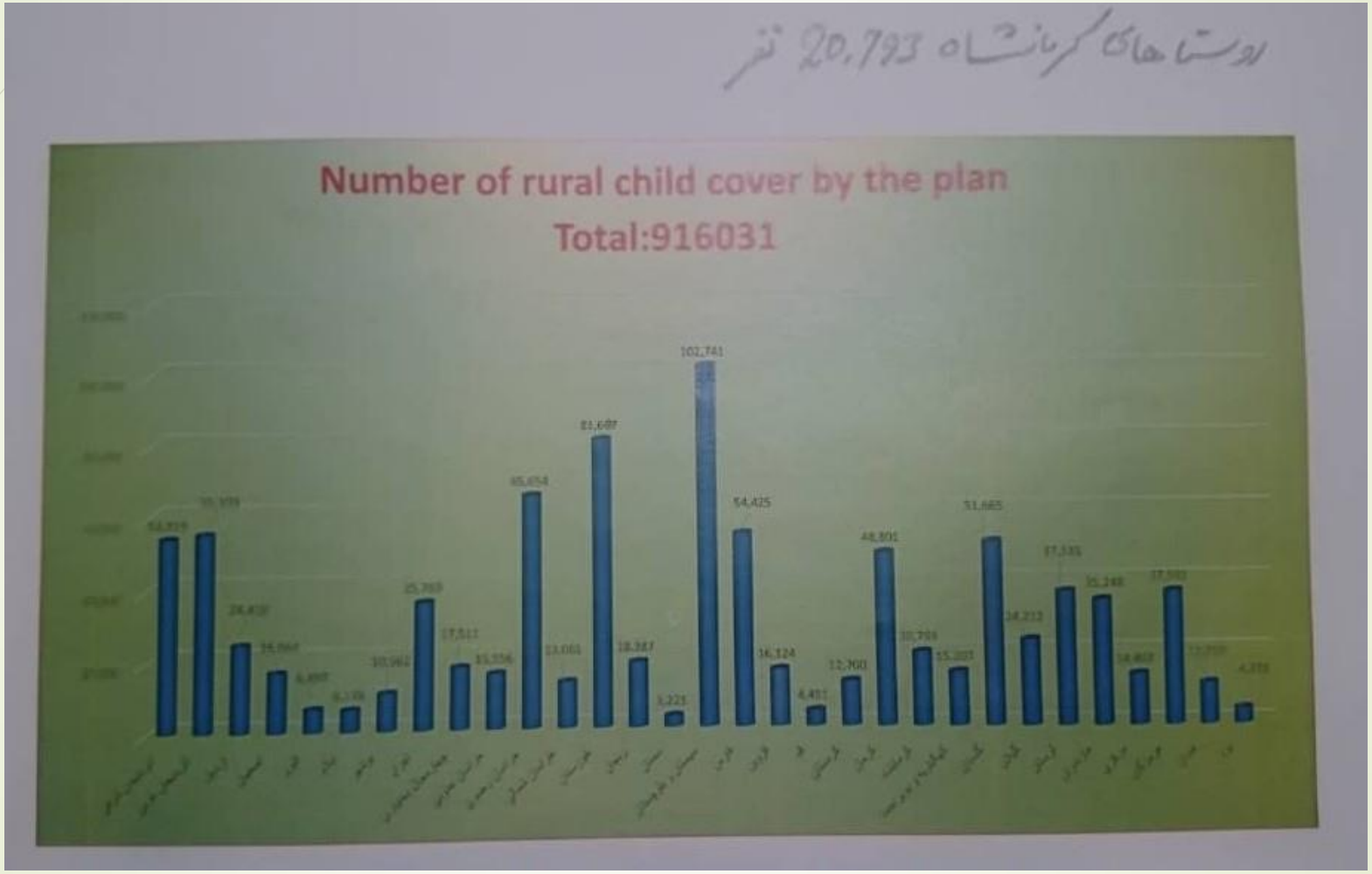
Iranian amblyopia prevention program

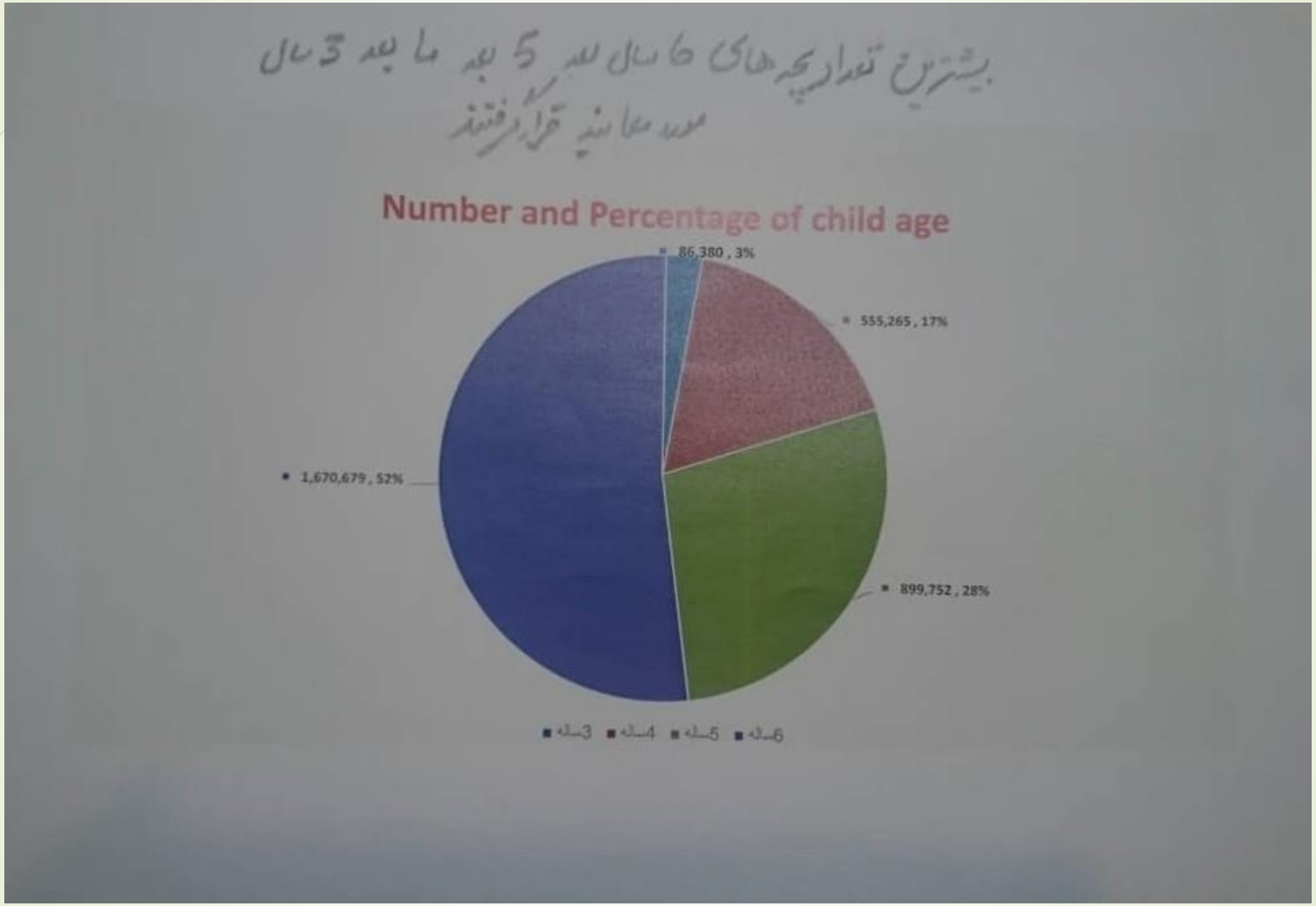
- 2016

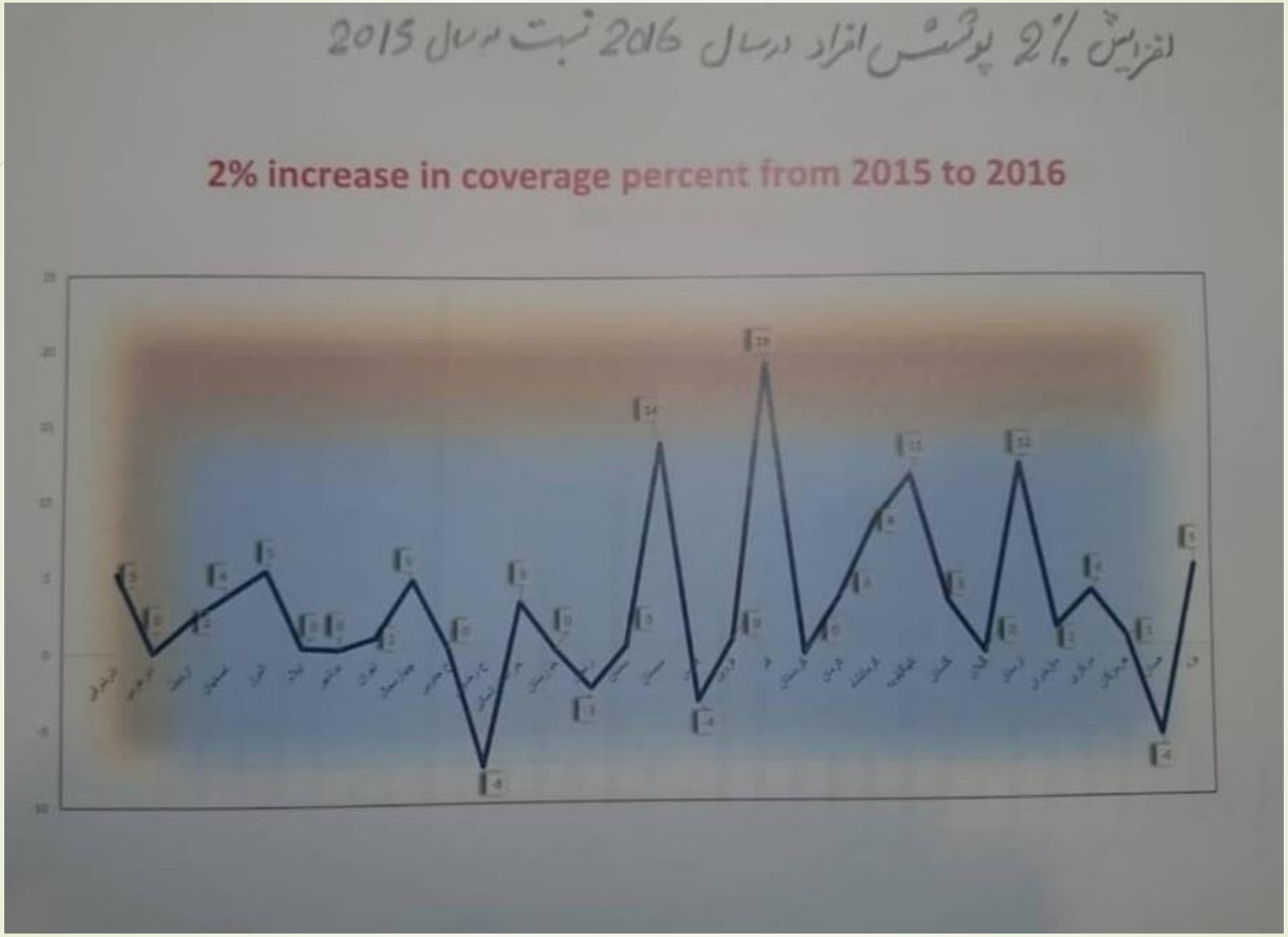


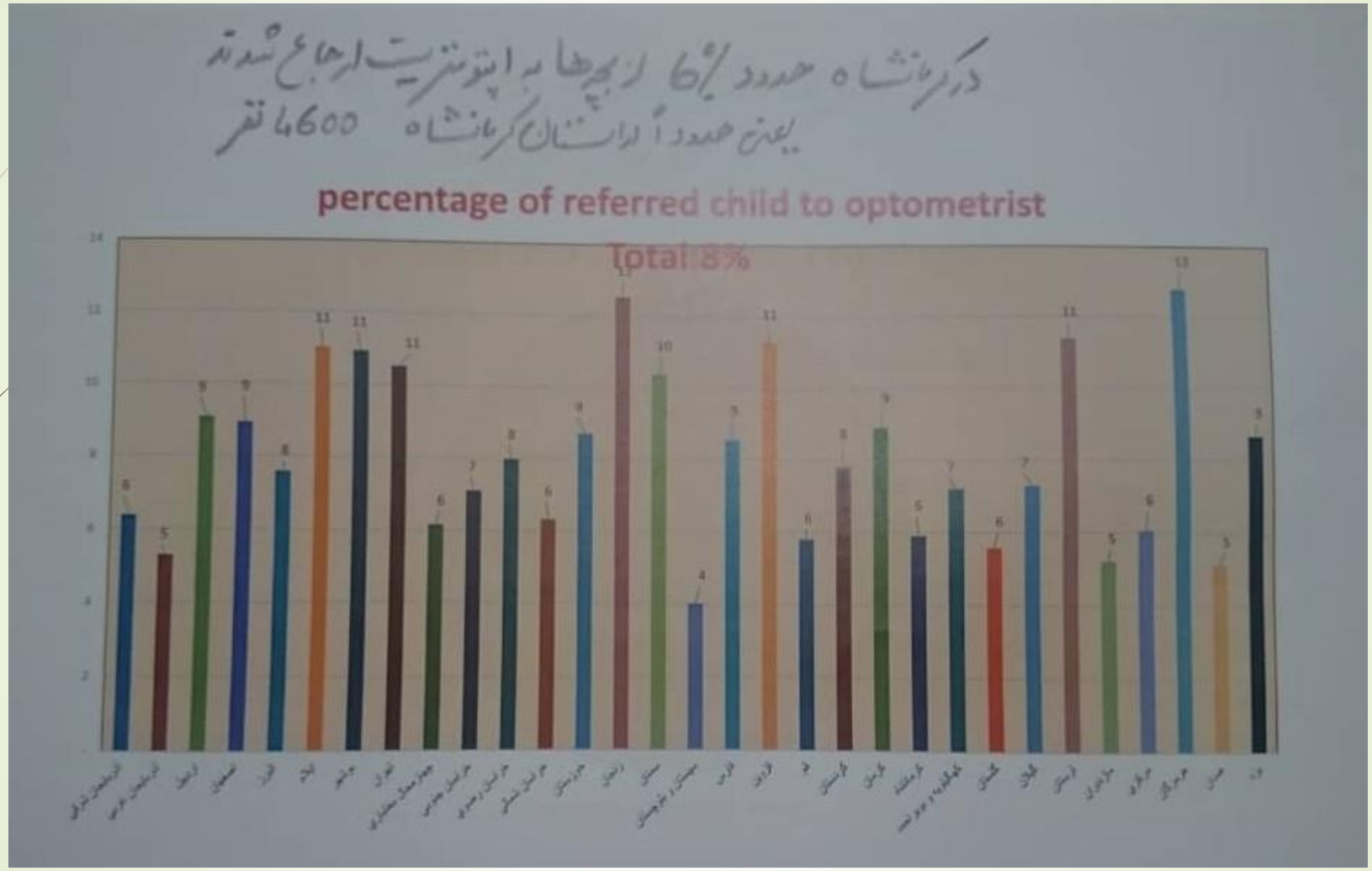
تعداد کل کودکانی که در سال 2016 در این طرح معاینه شده‌اند (در ایران) 3,212,016 نفر
استان کرمانشاه 76,853 نفر
Number of child covered by this program in 2016
Total:3212076

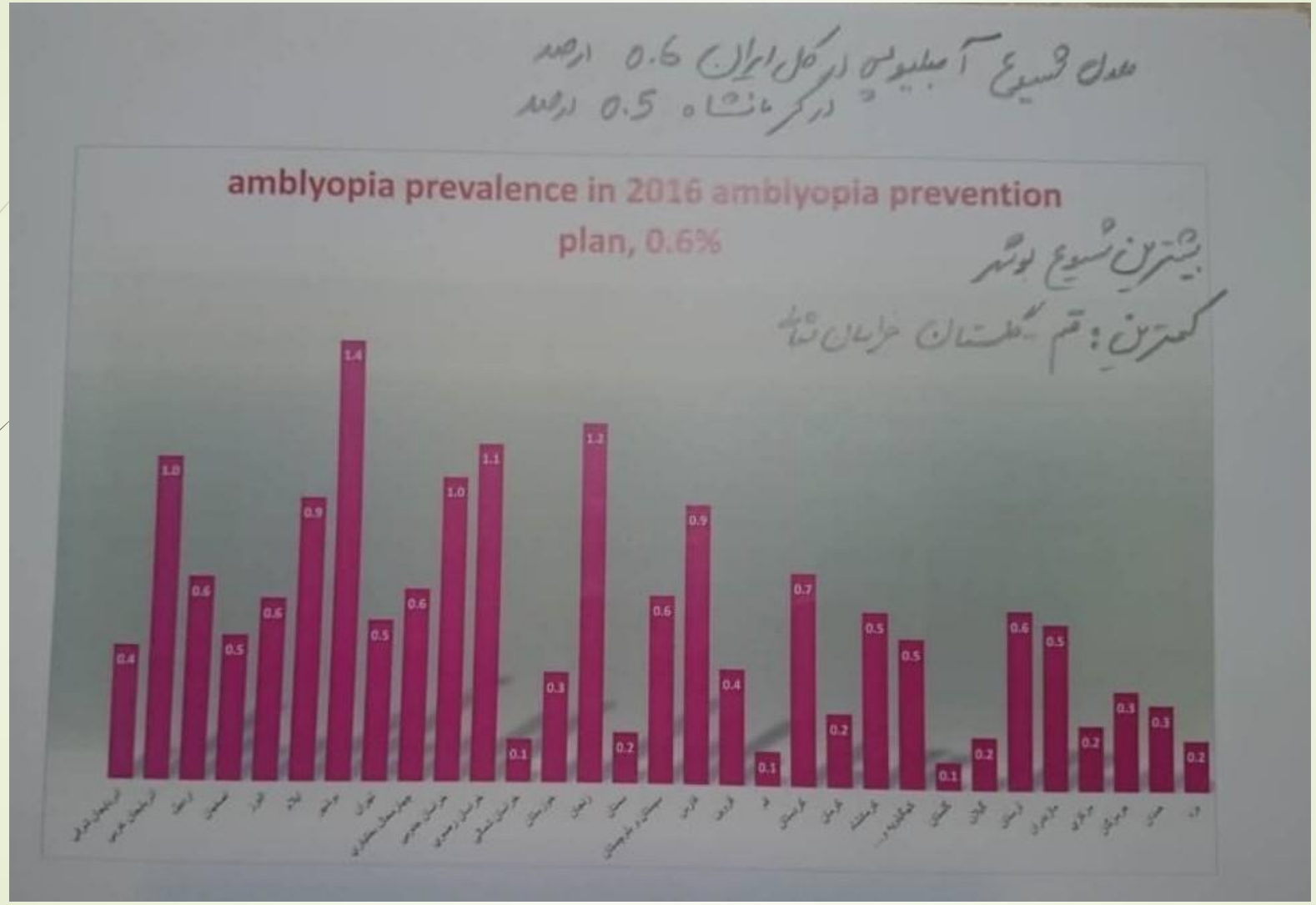

Number of urban child cover by the plan
Total:2121455
102,580
93,303
162,197
86,419
10,920
22,328
499,734
25,133
21,963
116,568
12,572
205,738
21,649
13,952
82,670
126,345
27,553
37,888
45,455
63,885
46,191
20,850
28,981
40,001
51,464
60,900
18,474

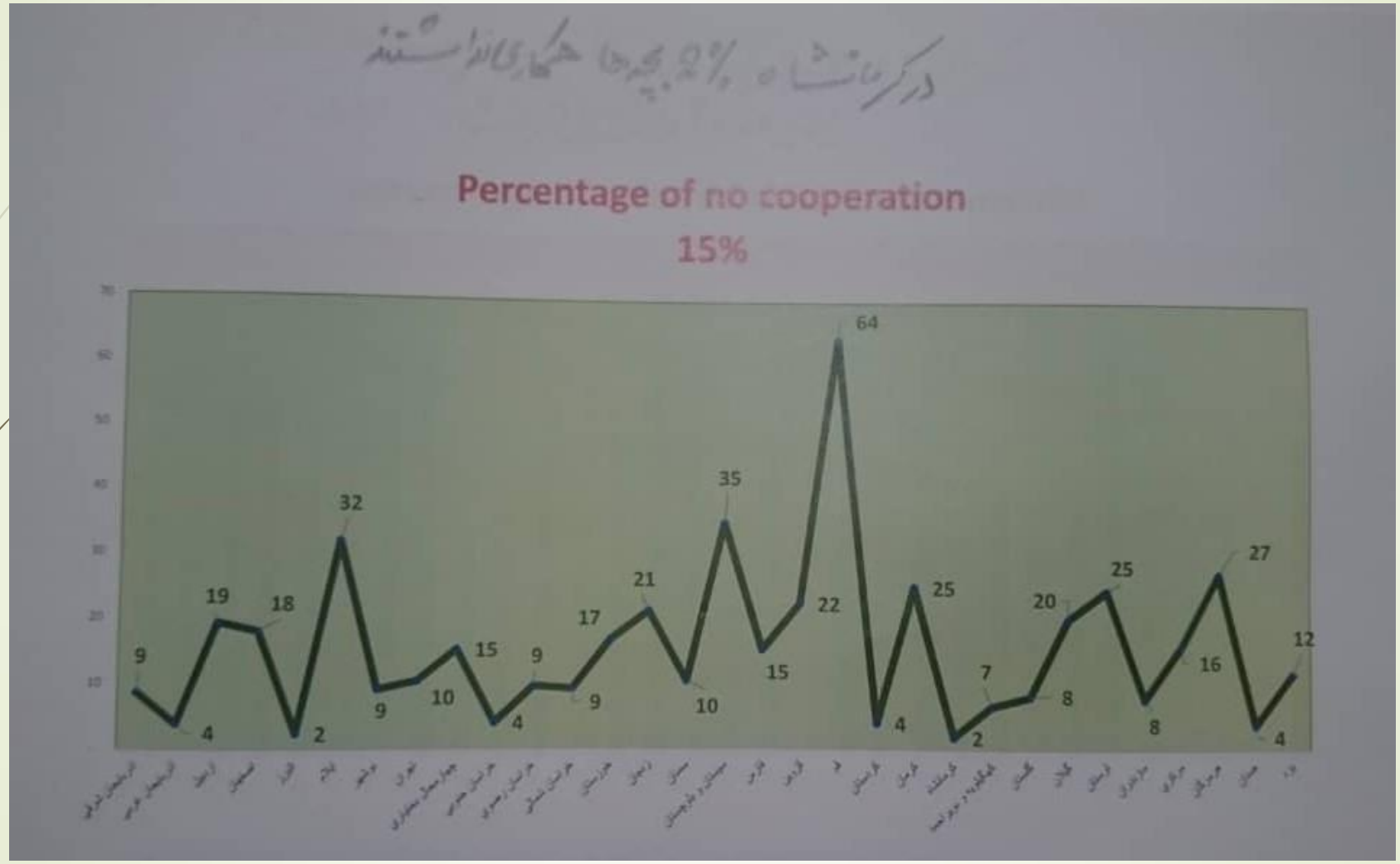

روستاهای کرمانشاه 20,793 نفر
Number of rural child cover by the plan
Total:916031

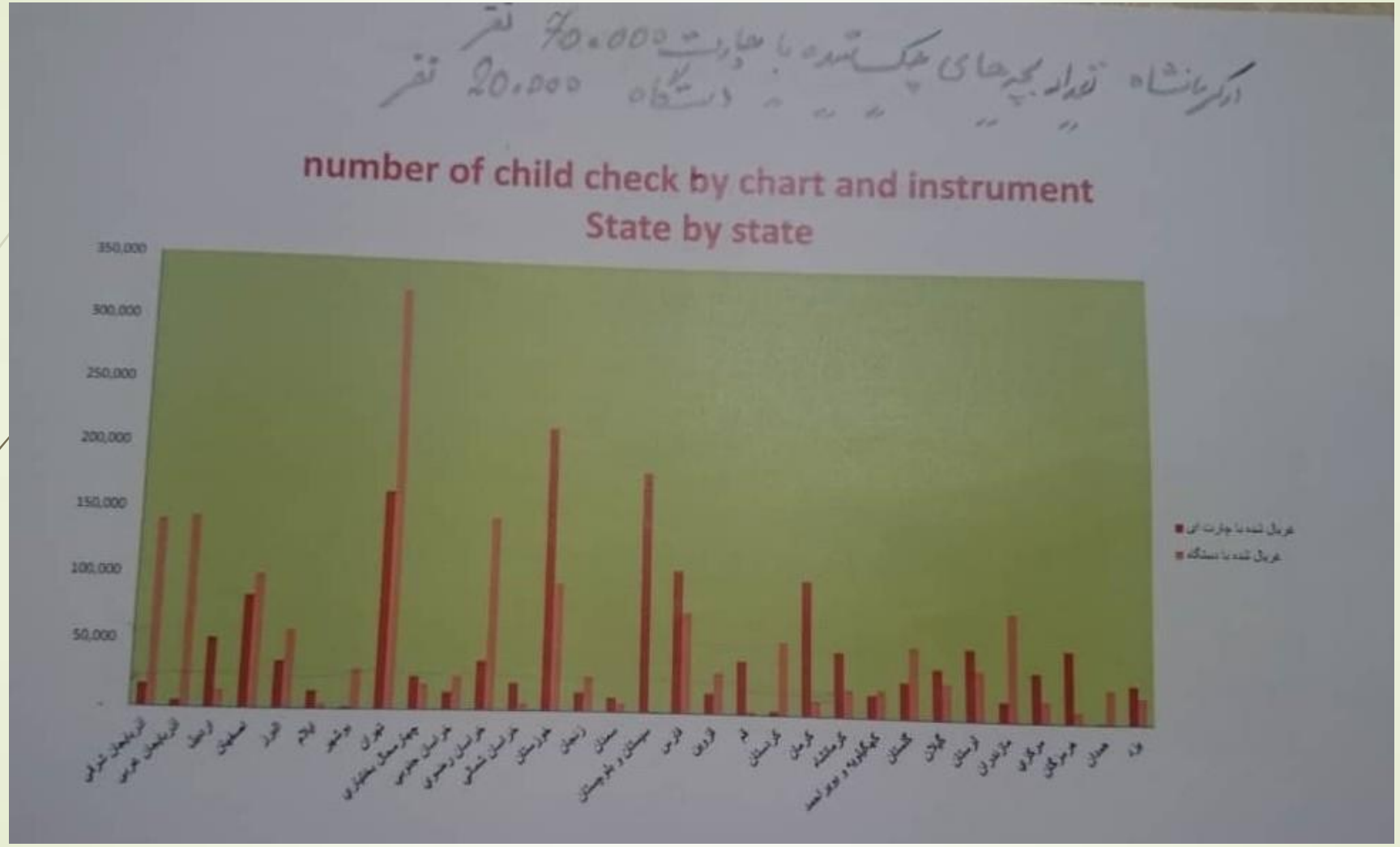

بیشترین تعداد بچه های 6 سال به بعد ما به 3 سال
مورد معاینه قرار گرفتند
Number and Percentage of child age
86,380 , 3%
555,265 , 17%
1,670,679 , 52%
899,752 , 28%
ساله 3
ساله 4
ساله 5
ساله 6

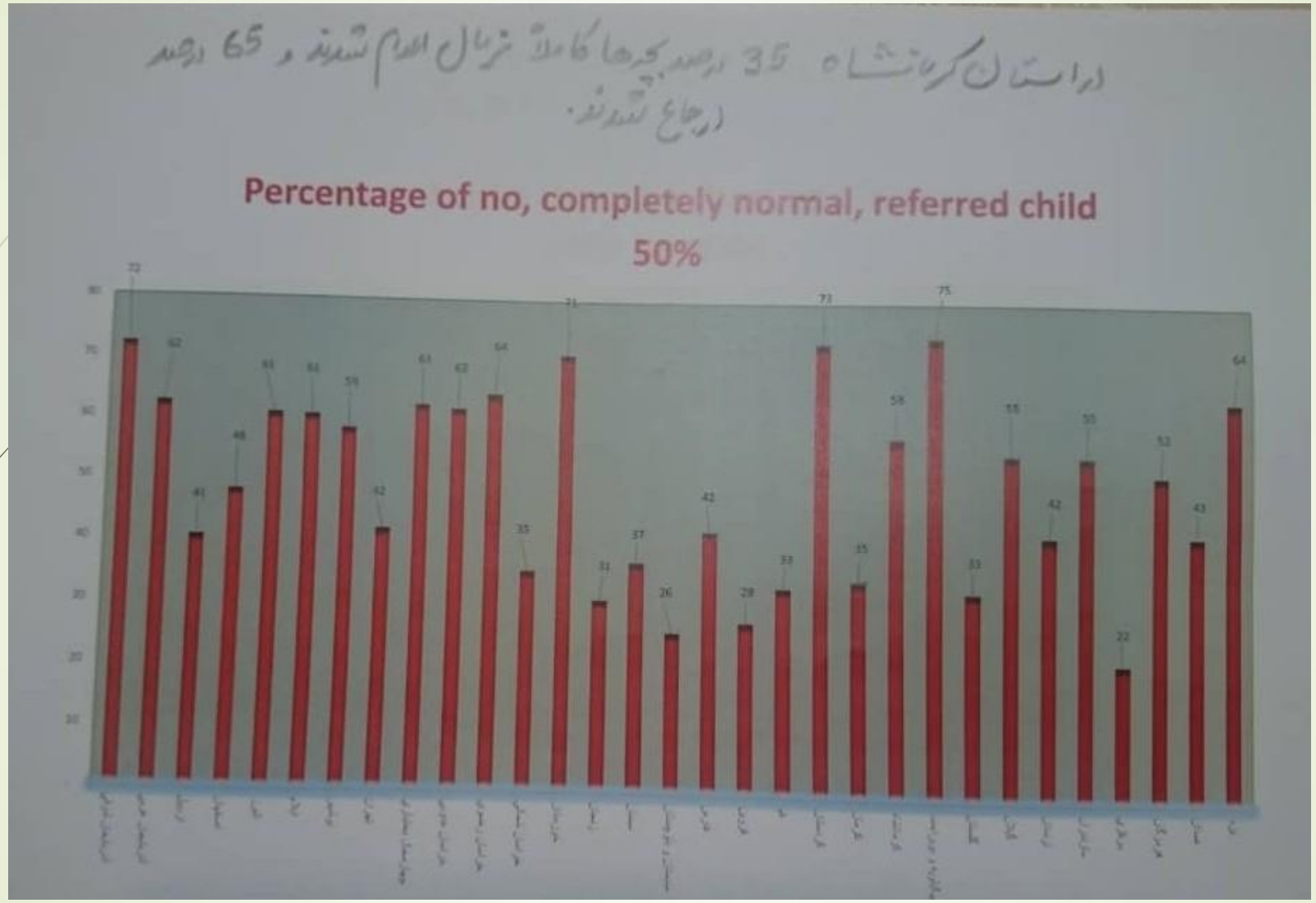

افزایش 2% پوشش افراد در سال 2016 نسبت به سال 2015
2% increase in coverage percent from 2015 to 2016

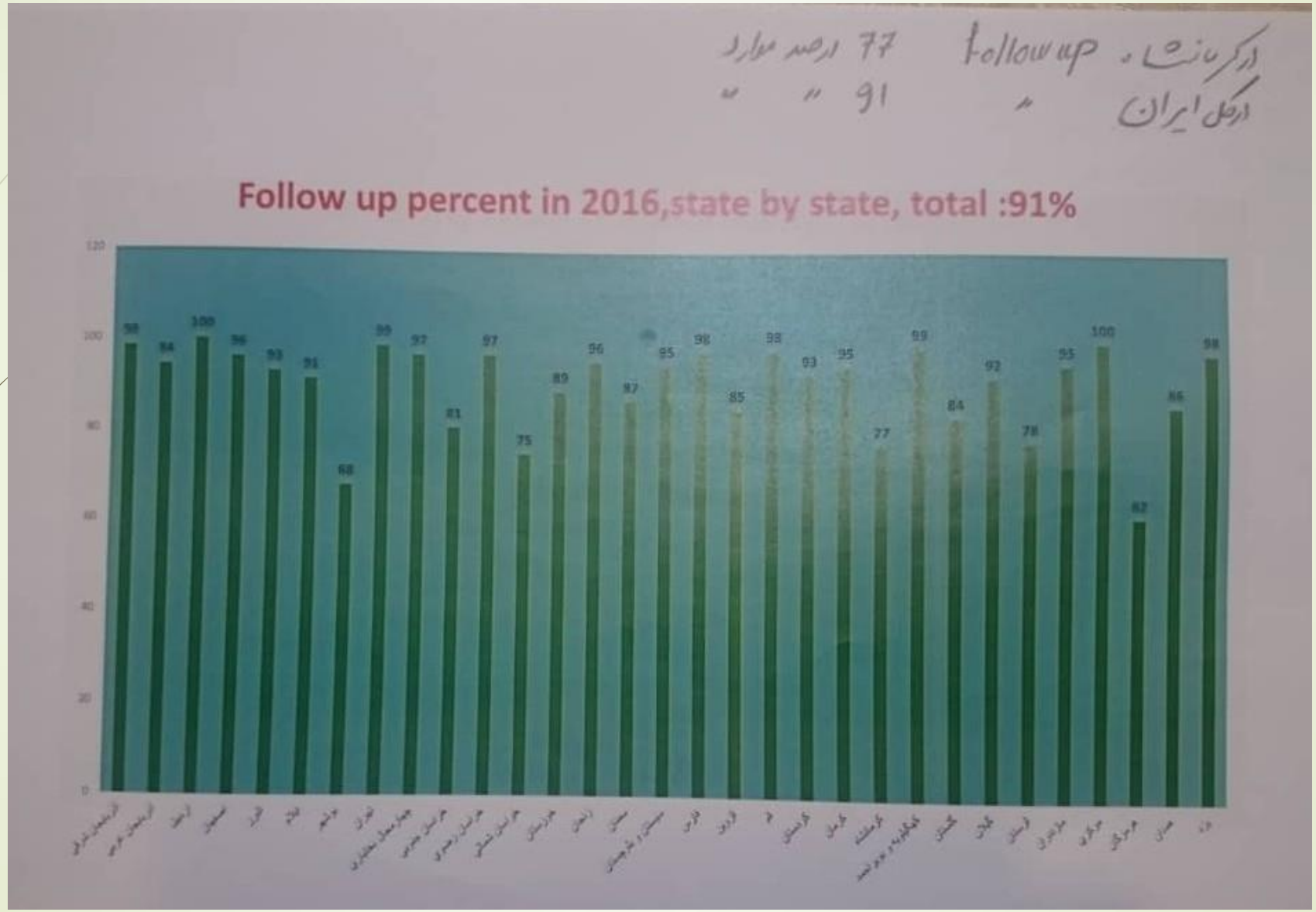

در کرمانشاه حدود 6% از بچه ها به اپتومتریست ارجاع شدند
یعنی حدود 4600 نفر
percentage of referred child to optometrist
Total 8%

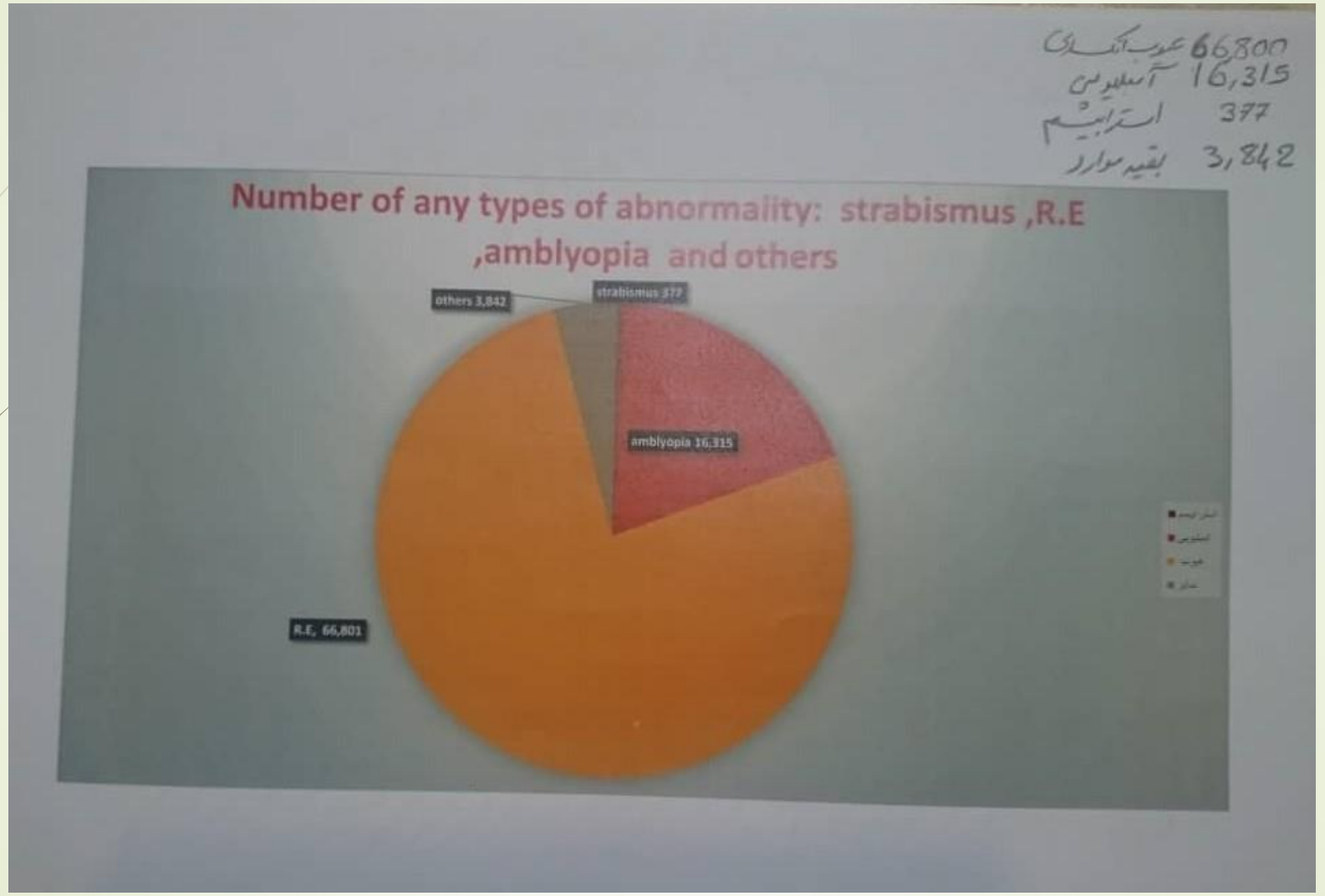

amblyopia prevalence in 2016 amblyopia prevention plan, 0.6%
0.4
1.0
0.6
0.5
0.6
0.9
1.4
0.5
0.6
1.0
1.1
0.1
0.3
1.2
0.2
0.6
0.9
0.4
0.1
0.7
0.2
0.5
0.5
0.1
0.2
0.6
0.5
0.2
0.3
0.3
0.2

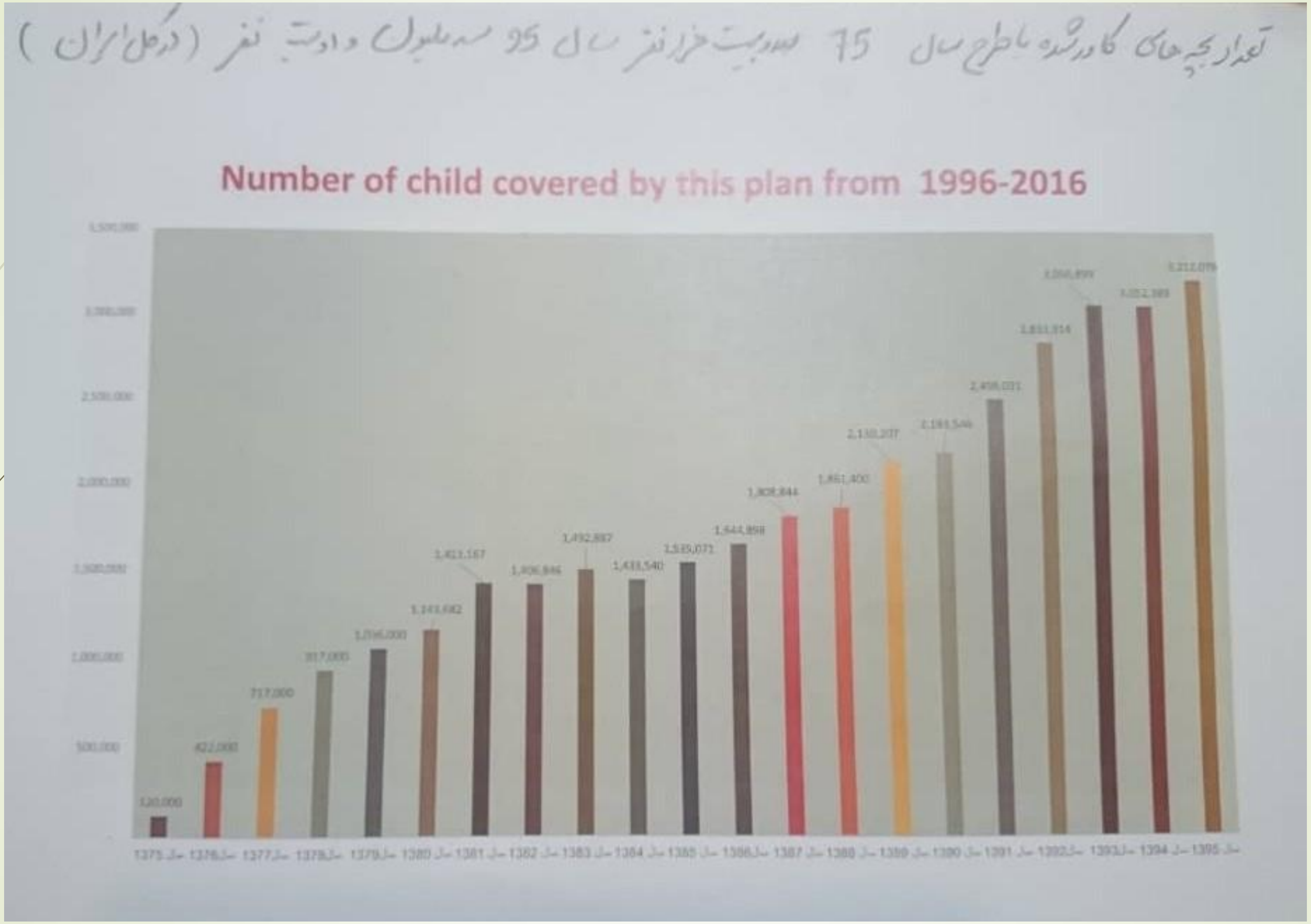

در کرمانشاه ۵% بچه‌ها همکاری نداشتند
Percentage of no cooperation
15%
9
4
19
18
2
32
9
10
15
4
9
9
17
21
10
35
15
22
64
4
25
2
7
8
20
25
8
16
27
4
12


اگر با شاه تعداد بچه های چک شده با عبارت ۵۰،۰۰۰ نفر
دستگاه ۲۰،۰۰۰ نفر
number of child check by chart and instrument
State by state
350,000
300,000
250,000
200,000
150,000
100,000
50,000
-


استان کرمانشاه 35 درصد بچه‌ها کاملاً نرمال اعلام شدند و 65 درصد
ارجاع شدند.
Percentage of no, completely normal, referred child
50%


Follow up percent in 2016,state by state, total :91%
98
94
100
96
93
91
68
99
97
81
97
75
89
96
87
95
98
85
98
93
95
77
99
84
92
78
95
100
82
86
98

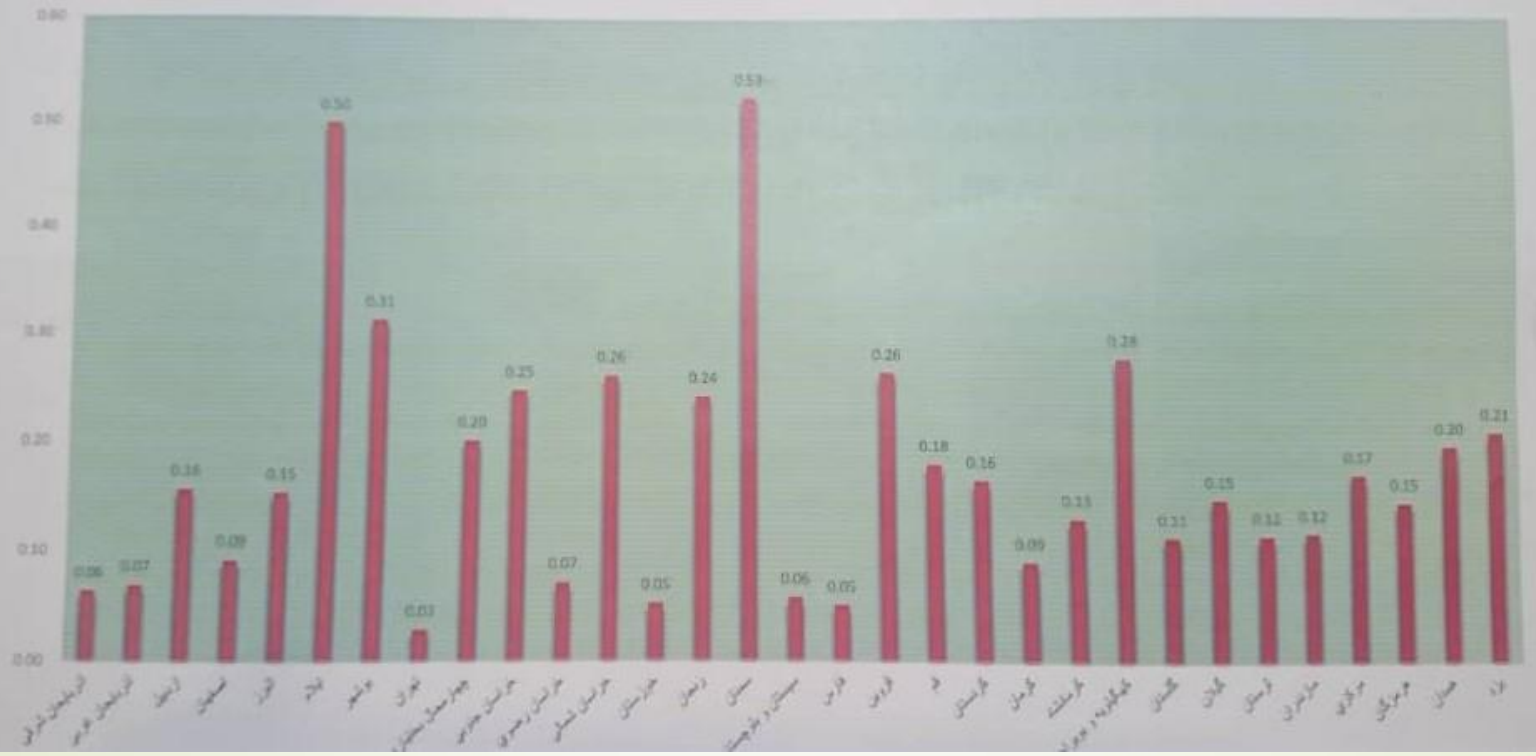

66,800 عیوب انکساری
16,315 آمبلیوپی
377 استرابیسم
3,842 بقیه موارد
Number of any types of abnormality: strabismus ,R.E ,amblyopia and others
others 3,842
strabismus 377
amblyopia 16,315
R.E, 66,801


Number of child covered by this plan from 1996-2016
422,000
717,000
1,433,540
1,861,400
2,130,207
1375 سال
1376 سال
1377 سال
1378 سال
1379 سال
1380 سال
1381 سال
1382 سال
1383 سال
1384 سال
1385 سال
1386 سال
1387 سال
1388 سال
1389 سال
1390 سال
1391 سال
1392 سال
1393 سال
1394 سال
1395 سال

شیوع استرابیسم در کرمانشاه ۰/۱۳٪ معدل کل ایران ۰/۵۱٪

بیشترین مبتلا بودیم کمترین تهران

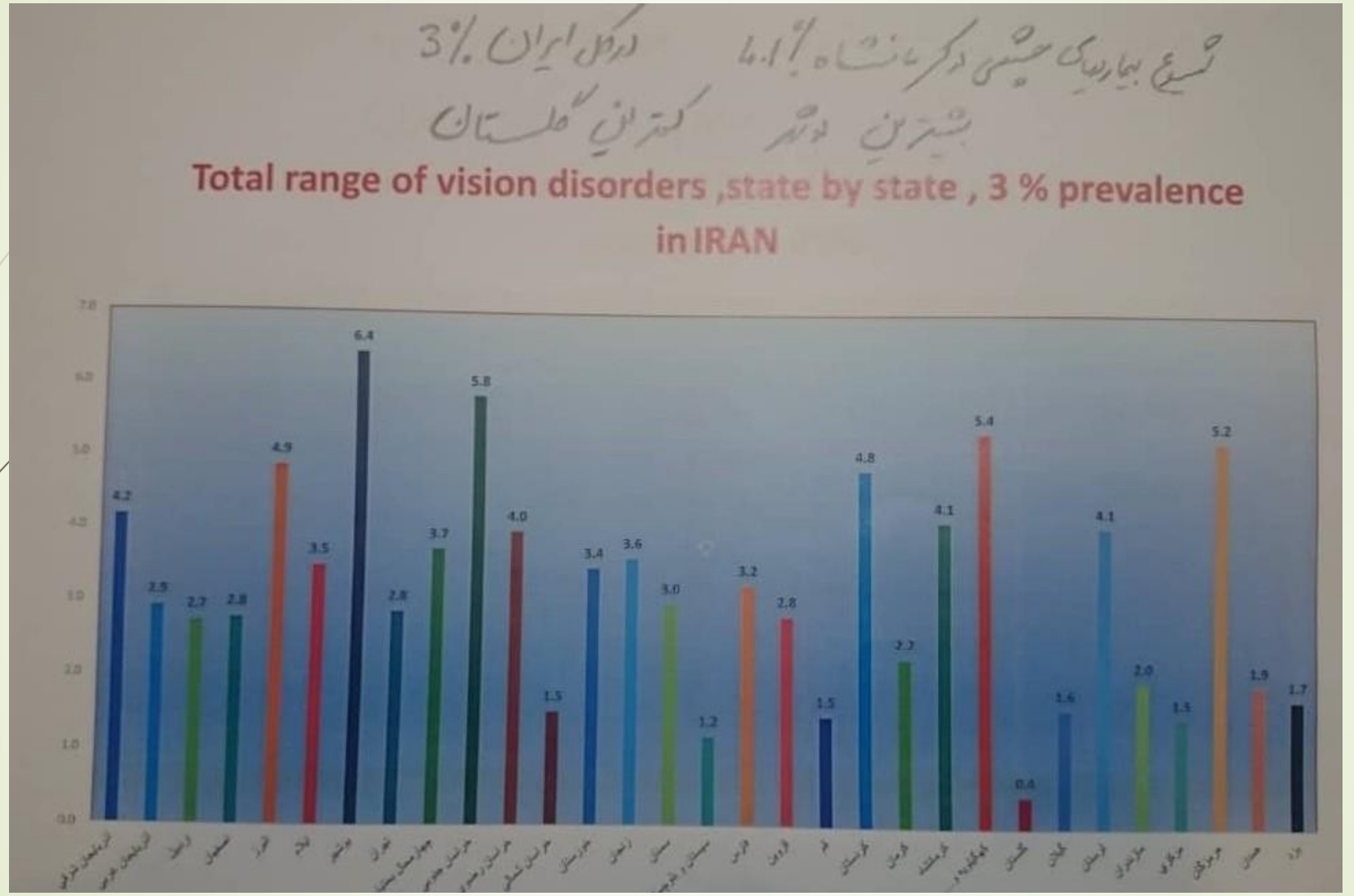
strabism prevalence in 2016,state by state, that in average is 0.01%



ارجاع به افتالمولوژیست ۴٪

3-ophthalmologist

- Because of very low refer for pathological problems to ophthalmologists there is no independent graph for this section of amblyopia prevention program.(about 4 % of abnormal cases)


شیوع بیماریهای چشمی در کرمانشاه 4.1٪
در کل ایران 3٪
بیشترین نوشهر
کمترین گلستان
Total range of vision disorders ,state by state , 3 % prevalence
in IRAN
4.2
2.5
2.7
2.8
4.9
3.5
6.4
2.8
3.7
5.8
4.0
1.5
3.4
3.6
3.0
1.2
3.2
2.8
1.5
4.8
2.2
4.1
5.4
0.4
1.6
4.1
2.0
1.5
5.2
1.9
1.7

Thank you for attention