

**Audizione informale presso  
la Task Force Coronavirus  
Ministero della Salute**

Roma, 20 febbraio 2020

**Nino Cartabellotta**

Presidente Fondazione GIMBE

# Outline

- **COVID-19 dataroom**
- **Analisi al 19 febbraio 2020**
- **Modello predittivo**



# Disclosure

- La Fondazione GIMBE ha sviluppato una dataroom sull'epidemia COVID-19 per attività di ricerca indipendente, divulgazione pubblica e advocacy istituzionale.
- La dataroom è stata sviluppata e viene mantenuta dalla Fondazione GIMBE senza alcun supporto istituzionale o commerciale
- La dataroom viene alimentata dal 21 gennaio 2020 con i dati dell'Organizzazione Mondiale della Sanità e dal 21 febbraio con quelli della Protezione Civile, del Ministero della Salute e dell'Istituto Superiore di Sanità
- La Fondazione GIMBE condivide oggi alcune analisi e rimane disponibile ad effettuarne ulteriori, secondo le necessità di questa rispettabile Commissione.

# Outline

- **COVID-19 dataroom**
- **Analisi al 19 febbraio 2020**
- **Modello predittivo**



# COVID-19 dataroom

- Fonte: report WHO, con esclusione di quelli antecedenti il 27 gennaio (dati frammentati e incompleti=
- Importazione quotidiana di:
  - casi confermati
  - decessi
- Definizione "sottogruppi" geografici
- Check di consistenza
- Predisposizione di analisi standard
- Tracciatura differenze con report ECDC

Casi confermati	27-gen	28-gen	29-gen	30-gen	31-gen	1-feb	2-feb	3-feb	4-feb	5-feb	6-feb	7-feb	8-feb	9-feb	10-feb	11-feb
<b>Cina</b>	2.761	4.537	5.997	7.736	9.720	11.821	14.411	17.238	20.471	24.363	28.060	31.211	34.598	37.251	40.235	42.708
<b>Hubei</b>	ND	ND	ND	ND	ND	7.153	9.074	11.177	13.522	16.678	19.665	22.112	24.953	27.100	29.631	31.728
<b>Province confinanti</b>	ND	ND	ND	ND	ND	1.733	2.007	2.314	2.703	3.034	3.315	3.607	3.836	4.044	4.234	4.386
<b>Altre province</b>	ND	ND	ND	ND	ND	2.935	3.330	3.747	4.246	4.651	5.080	5.492	5.809	6.107	6.370	6.594
<b>Resto del mondo</b>	37	56	68	82	106	132	146	153	159	191	216	270	288	307	319	395
<b>Europa</b>	3	4	8	10	14	22	23	25	27	28	28	31	32	37	39	43
<b>Altri paesi</b>	34	52	60	72	92	110	123	128	132	153	168	178	192	206	210	217
<b>Diamond Princess</b>	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	20	61	64	64	70	135
<b>Totale</b>	<b>2.798</b>	<b>4.593</b>	<b>6.065</b>	<b>7.818</b>	<b>9.826</b>	<b>11.953</b>	<b>14.557</b>	<b>17.391</b>	<b>20.630</b>	<b>24.554</b>	<b>28.276</b>	<b>31.481</b>	<b>34.886</b>	<b>37.558</b>	<b>40.554</b>	<b>43.103</b>
<b>Casi confermati (% sul totale)</b>	<b>27-gen</b>	<b>28-gen</b>	<b>29-gen</b>	<b>30-gen</b>	<b>31-gen</b>	<b>1-feb</b>	<b>2-feb</b>	<b>3-feb</b>	<b>4-feb</b>	<b>5-feb</b>	<b>6-feb</b>	<b>7-feb</b>	<b>8-feb</b>	<b>9-feb</b>	<b>10-feb</b>	<b>11-feb</b>
<b>Cina</b>	98,68%	98,78%	98,88%	98,95%	98,92%	98,90%	99,00%	99,12%	99,23%	99,22%	99,24%	99,14%	99,17%	99,18%	99,21%	99,08%
<b>Hubei</b>	-	-	-	-	-	59,84%	62,33%	64,27%	65,55%	67,92%	69,55%	70,24%	71,53%	72,16%	73,07%	73,61%
<b>Province confinanti</b>	-	-	-	-	-	14,50%	13,79%	13,31%	13,10%	12,36%	11,72%	11,46%	11,00%	10,77%	10,44%	10,18%
<b>Altre province</b>	-	-	-	-	-	24,55%	22,88%	21,55%	20,58%	18,94%	17,97%	17,45%	16,65%	16,26%	15,71%	15,30%
<b>Resto del mondo</b>	1,32%	1,22%	1,12%	1,05%	1,08%	1,10%	1,00%	0,88%	0,77%	0,78%	0,76%	0,86%	0,83%	0,82%	0,79%	0,92%
<b>Europa</b>	0,11%	0,09%	0,13%	0,13%	0,14%	0,18%	0,16%	0,14%	0,13%	0,11%	0,10%	0,10%	0,09%	0,10%	0,10%	0,10%
<b>Altri paesi</b>	1,22%	1,13%	0,99%	0,92%	0,94%	0,92%	0,84%	0,74%	0,64%	0,62%	0,59%	0,57%	0,55%	0,55%	0,52%	0,50%
<b>Diamond Princess</b>	-	-	-	-	-	-	-	-	-	0,04%	0,07%	0,19%	0,18%	0,17%	0,17%	0,31%
<b>Incrementi % assoluti</b>	<b>27-gen</b>	<b>28-gen</b>	<b>29-gen</b>	<b>30-gen</b>	<b>31-gen</b>	<b>1-feb</b>	<b>2-feb</b>	<b>3-feb</b>	<b>4-feb</b>	<b>5-feb</b>	<b>6-feb</b>	<b>7-feb</b>	<b>8-feb</b>	<b>9-feb</b>	<b>10-feb</b>	<b>11-feb</b>
<b>Cina</b>	-	64,3%	32,2%	29,0%	25,6%	21,6%	21,9%	19,6%	18,8%	19,0%	15,2%	11,2%	10,9%	7,7%	8,0%	6,1%
<b>Hubei</b>	-	-	-	-	-	-	26,9%	23,2%	21,0%	23,3%	17,9%	12,4%	12,8%	8,6%	9,3%	7,1%
<b>Province confinanti</b>	-	-	-	-	-	-	15,8%	15,3%	16,8%	12,2%	9,3%	8,8%	6,3%	5,4%	4,7%	3,6%
<b>Altre province</b>	-	-	-	-	-	-	13,5%	12,5%	13,3%	9,5%	9,2%	8,1%	5,8%	5,1%	4,3%	3,5%
<b>Resto del mondo</b>	-	51,4%	21,4%	20,6%	29,3%	24,5%	10,6%	4,8%	3,9%	20,1%	13,1%	25,0%	6,7%	6,6%	3,9%	23,8%
<b>Europa</b>	-	33,3%	100,0%	25,0%	40,0%	57,1%	4,5%	8,7%	8,0%	3,7%	0,0%	10,7%	3,2%	15,6%	5,4%	10,3%
<b>Altri paesi</b>	-	52,9%	15,4%	20,0%	27,8%	19,6%	11,8%	4,1%	3,1%	15,9%	9,8%	6,0%	7,9%	7,3%	1,9%	3,3%
<b>Diamond Princess</b>	-	-	-	-	-	-	-	-	-	-	100,0%	205,0%	4,9%	0,0%	9,4%	92,9%
Europa per modello predittivo	-	33,3%	100,0%	25,0%	40,0%	57,1%	4,5%	8,7%	8,0%	3,7%	0,0%	10,7%	3,2%	15,6%	5,4%	10,3%

Province/ Region/ City / Confirmed cas	Population	IMPORT	1-feb	2-feb	3-feb	4-feb	5-feb	6-feb	7-feb	8-feb	9-feb	10-feb	11-feb	12-feb	13-feb	14-feb	15-feb	16-feb	17-feb	18-feb	19-feb
Hubei	59.170.000	59989	7.153	9.074	11.177	13.522	16.678	19.665	22.112	24.953	27.100	29.631	31.728	33.366	48.206	51.986	54.406	56.249	58.182	59.989	61.682
Guangdong	113.460.000	1328	520	604	683	797	870	944	1.018	1.075	1.120	1.151	1.177	1.219	1.241	1.261	1.294	1.316	1.322	1.328	1.331
Henan	96.050.000	1257	422	493	566	675	764	851	914	981	1.033	1.073	1.105	1.135	1.169	1.184	1.212	1.231	1.246	1.257	1.262
Zhejiang	57.370.000	1172	599	661	724	829	895	954	1.006	1.048	1.075	1.104	1.117	1.131	1.145	1.155	1.162	1.167	1.171	1.172	1.173
Hunan	68.990.000	1007	389	463	521	593	661	711	772	803	838	879	912	946	968	988	1.001	1.004	1.006	1.007	1.008
Anhui	63.240.000	982	297	340	408	480	530	591	665	733	779	830	860	889	910	934	950	962	973	982	984
Jiangxi	46.480.000	933	286	333	391	476	548	600	661	698	740	771	804	844	872	900	913	925	930	933	934
Jiangsu	80.510.000	629	202	231	271	308	341	373	408	439	468	492	515	543	570	593	604	617	626	629	631
Chongqing	31.020.000	553	238	262	300	337	366	389	411	426	446	468	486	505	518	529	537	544	551	553	555
Shandong	100.470.000	543	202	225	246	270	298	343	379	407	435	459	486	497	506	519	530	537	541	543	544
Sichuan	83.410.000	508	207	236	254	282	301	321	344	363	386	405	417	436	451	463	470	481	495	508	514
Heilongjiang	37.730.000	464	80	95	118	155	190	227	277	282	307	331	360	378	395	418	425	445	457	464	470
Beijing	21.540.000	387	156	183	212	228	253	274	297	315	326	337	342	352	366	372	375	380	381	387	393
Shanghai	24.240.000	333	153	177	193	208	233	254	269	281	292	295	302	306	313	318	326	328	331	333	333
Hebei	75.560.000	302	96	104	113	126	135	157	171	195	206	218	239	251	265	283	291	300	301	302	306
Fujian	39.410.000	292	144	159	179	194	205	215	224	239	250	261	267	272	279	281	285	287	290	292	293
Guangxi	49.260.000	242	100	111	127	139	150	168	172	183	195	210	215	222	222	226	235	237	238	242	244
Shaanxi	38.640.000	240	101	116	128	142	165	173	184	195	208	213	219	225	229	230	232	236	240	240	242
Yunnan	48.300.000	172	91	99	109	117	122	128	135	138	140	141	149	154	155	162	168	169	171	172	173
Hainan	9.340.000	163	57	63	70	79	89	100	111	123	128	136	142	145	157	162	162	162	162	163	163
Guizhou	36.000.000	146	29	38	46	56	64	69	77	89	96	109	118	131	135	140	143	144	146	146	146
Shanxi	37.180.000	130	47	56	66	74	81	90	96	104	115	119	122	124	126	126	127	128	129	130	131
Tianjin	15.600.000	125	34	40	49	63	67	70	79	81	88	91	96	106	112	119	120	122	124	125	128
Liaoning	43.590.000	121	60	64	70	74	81	89	94	99	105	107	108	111	116	117	119	120	121	121	121
Gansu	26.370.000	91	35	45	51	56	57	62	70	71	81	85	86	86	87	90	90	90	91	91	91
Jilin	27.040.000	89	17	21	31	42	54	59	65	69	78	80	81	83	84	86	88	89	89	89	90
Xinjiang	24.870.000	76	18	23	24	29	32	36	39	42	45	49	55	59	63	65	70	71	73	76	76
Ningxia	6.880.000	70	26	28	31	34	34	40	43	45	45	49	53	58	64	67	70	70	70	70	71
Inner Mongolia	25.340.000	73	23	26	33	37	42	46	49	50	54	58	58	60	61	63	68	70	72	73	75
Hong Kong Sar	7.450.000	60	13	14	15	15	18	21	24	26	26	36	42	49	50	53	56	56	57	60	62
Taipei and environs	23.590.000	22	10	10	10	10	11	11	16	16	17	18	18	18	18	18	18	18	20	22	22
Qinghai	6.030.000	18	8	9	13	15	17	18	18	18	18	18	18	18	18	18	18	18	18	18	18
Macao Sar	660.000	10	7	7	8	8	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Xizang	3.440.000	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
<b>Totale</b>	<b>1.428.230.000</b>	<b>0</b>	<b>11.821</b>	<b>14.411</b>	<b>17.238</b>	<b>20.471</b>	<b>24.363</b>	<b>28.060</b>	<b>31.211</b>	<b>34.598</b>	<b>37.251</b>	<b>40.235</b>	<b>42.708</b>	<b>44.730</b>	<b>59.882</b>	<b>63.932</b>	<b>66.576</b>	<b>68.584</b>	<b>70.635</b>	<b>72.528</b>	<b>74.279</b>
<b>Totale province confinanti</b>	<b>344.420.000</b>		<b>1.733</b>	<b>2.007</b>	<b>2.314</b>	<b>2.703</b>	<b>3.034</b>	<b>3.315</b>	<b>3.607</b>	<b>3.836</b>	<b>4.044</b>	<b>4.234</b>	<b>4.386</b>	<b>4.544</b>	<b>4.666</b>	<b>4.765</b>	<b>4.845</b>	<b>4.902</b>	<b>4.946</b>	<b>4.972</b>	<b>4.987</b>
<b>Totale altre province</b>	<b>1.024.640.000</b>		<b>2.935</b>	<b>3.330</b>	<b>3.747</b>	<b>4.246</b>	<b>4.651</b>	<b>5.080</b>	<b>5.492</b>	<b>5.809</b>	<b>6.107</b>	<b>6.370</b>	<b>6.594</b>	<b>6.820</b>	<b>7.010</b>	<b>7.181</b>	<b>7.325</b>	<b>7.433</b>	<b>7.507</b>	<b>7.567</b>	<b>7.610</b>
CHECK FDP Hubei			OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
CHECK FDP province confinanti			OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
CHECK FDP altre province			OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
CHECK FDP Cina			OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK

WHO Region / Confirmed cases	Country/Territory/Area	IMPORT	27-gen	28-gen	29-gen	30-gen	31-gen	1-feb	2-feb	3-feb	4-feb	5-feb	6-feb	7-feb	8-feb	9-feb	10-feb	11-feb	12-feb	13-feb	14-feb	15-feb	16-feb
Western Pacific Region	Singapore	77 (2)	4	7	7	10	13	16	18	18	18	24	28	30	33	40	43	45	47	50	58	67	72
Western Pacific Region	Japan	65 (6)	4	6	7	11	14	17	20	20	20	33	25	25	25	26	26	26	28	29	33	41	53
Western Pacific Region	Republic of Korea	31 (1)	4	4	4	4	11	12	15	15	16	18	23	24	24	27	27	28	28	28	28	28	29
Western Pacific Region	Malaysia	22 (0)	4	4	4	7	8	8	8	8	10	10	12	14	15	17	18	18	18	18	19	21	22
Western Pacific Region	Viet Nam	16 (0)	2	2	2	2	5	6	7	8	9	10	10	12	13	14	14	15	15	16	16	16	16
Western Pacific Region	Australia	15 (0)	4	5	7	7	9	12	12	12	12	13	14	15	15	15	15	15	15	15	15	15	15
Western Pacific Region	Philippines	3 (0)	0	0	0	1	1	1	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3
Western Pacific Region	Cambodia	1 (0)	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
South-East Asia Region	Thailand	35 (0)	5	14	14	14	14	19	19	19	19	25	25	25	32	32	32	33	33	33	33	34	34
South-East Asia Region	India	3 (0)	0	0	0	1	1	1	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
South-East Asia Region	Nepal	1 (0)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
South-East Asia Region	Sri Lanka	1 (0)	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Region of the Americas	United States of America	15 (0)	5	5	5	5	6	7	8	11	11	11	12	12	12	12	12	13	13	14	15	15	15
Region of the Americas	Canada	8 (1)	1	2	3	3	3	4	4	4	4	5	5	7	7	7	7	7	7	7	7	7	7
European Region	Germany	16 (0)	0	1	4	4	5	7	8	10	12	12	12	13	14	14	14	14	16	16	16	16	16
European Region	France	12 (0)	3	3	4	5	6	6	6	6	6	6	6	6	6	11	11	11	11	11	11	11	12
European Region	The United Kingdom	9 (0)	0	0	0	0	0	2	2	2	2	2	2	2	3	3	3	4	8	8	9	9	9
European Region	Italy	3 (0)	0	0	0	0	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3
European Region	Russian Federation	2 (0)	0	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
European Region	Spain	2 (0)	0	0	0	0	0	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
European Region	Belgium	1 (0)	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
European Region	Finland	1 (0)	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
European Region	Sweden	1 (0)	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Eastern Mediterranean Region	United Arab Emirates	9 (0)	0	0	4	4	4	4	5	5	5	5	5	5	7	7	7	8	8	8	8	8	8
Eastern Mediterranean Region	Egypt	1 (0)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Other	International conveyance (Japan)	454## (0)	0	0	0	0	0	0	0	0	0	0	20	61	64	64	70	135	175	174	218	218	355
<b>TOTALE</b>			<b>37</b>	<b>56</b>	<b>68</b>	<b>82</b>	<b>106</b>	<b>132</b>	<b>146</b>	<b>153</b>	<b>159</b>	<b>191</b>	<b>216</b>	<b>270</b>	<b>288</b>	<b>307</b>	<b>319</b>	<b>395</b>	<b>441</b>	<b>447</b>	<b>505</b>	<b>526</b>	<b>683</b>
<b>Numero paesi coinvolti</b>			<b>11</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>19</b>	<b>23</b>	<b>23</b>	<b>23</b>	<b>23</b>	<b>24</b>	<b>25</b>	<b>25</b>	<b>25</b>	<b>25</b>	<b>25</b>	<b>25</b>	<b>25</b>	<b>25</b>	<b>25</b>	<b>26</b>	<b>26</b>
CHECK FOGLIO DATI PRINCIPALI			OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK



# Outline

- COVID-19 dataroom
- **Analisi al 19 febbraio 2020**
- Modello predittivo



# Coronavirus disease 2019 (COVID-19) Situation Report – 29

Data as reported by 19 February 2020\*

\*The situation report includes information provided by national authorities as of **10 AM Central European Time**

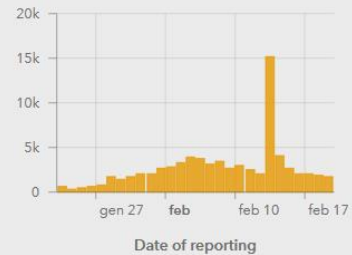
# 75.285

total cases\*

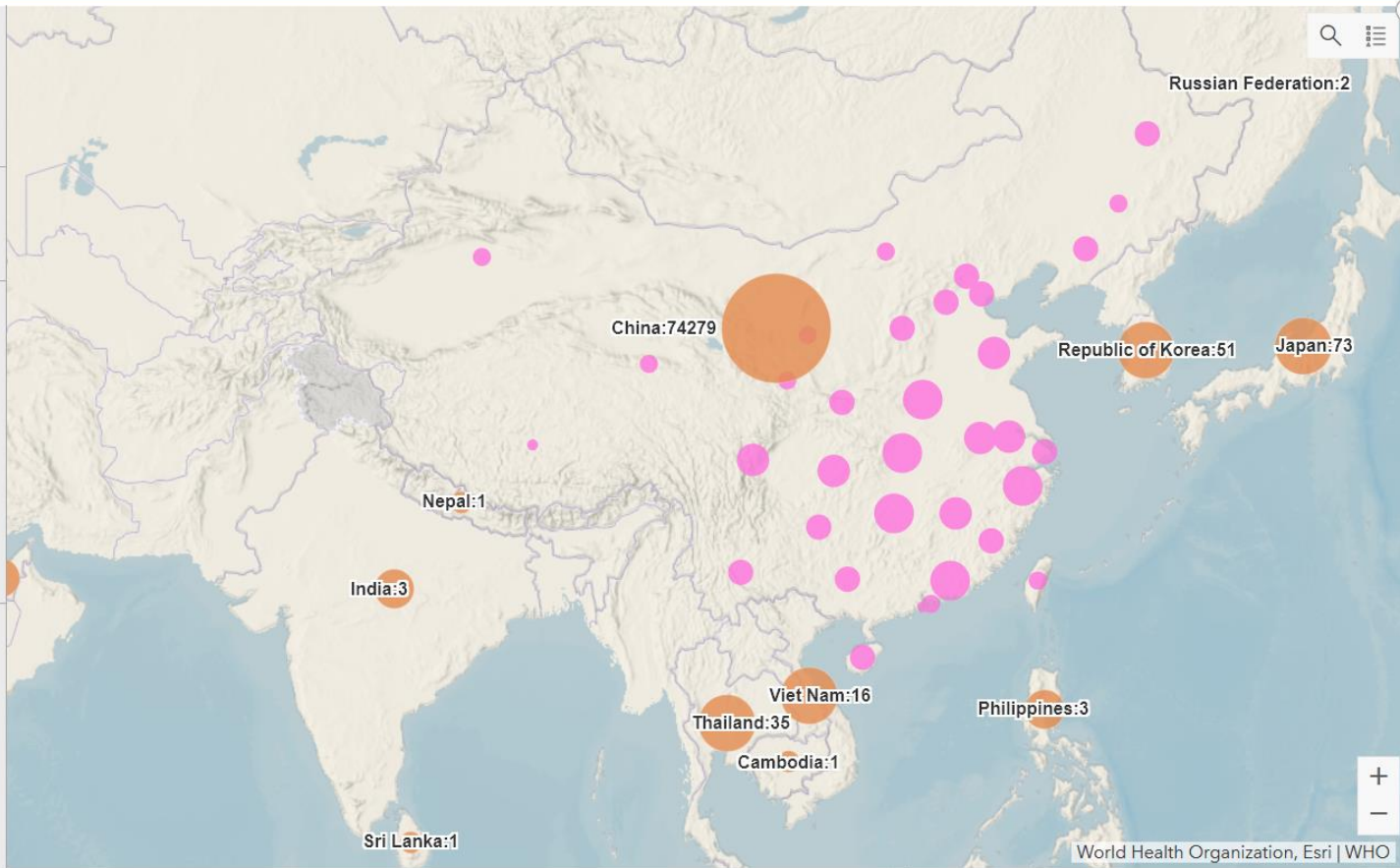
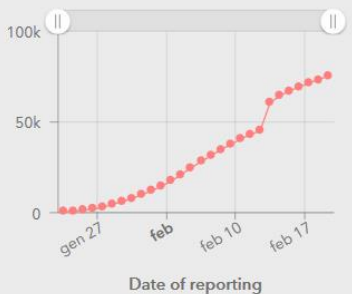
2.009  
deaths

26  
countries with cases

### Cases by date of report



### Cumulative cases



\* Effective 17 February, 'confirmed' cases include both laboratory-confirmed as previously reported, and clinically diagnosed (currently only applicable to Hubei province, China)  
The boundaries and names are shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning

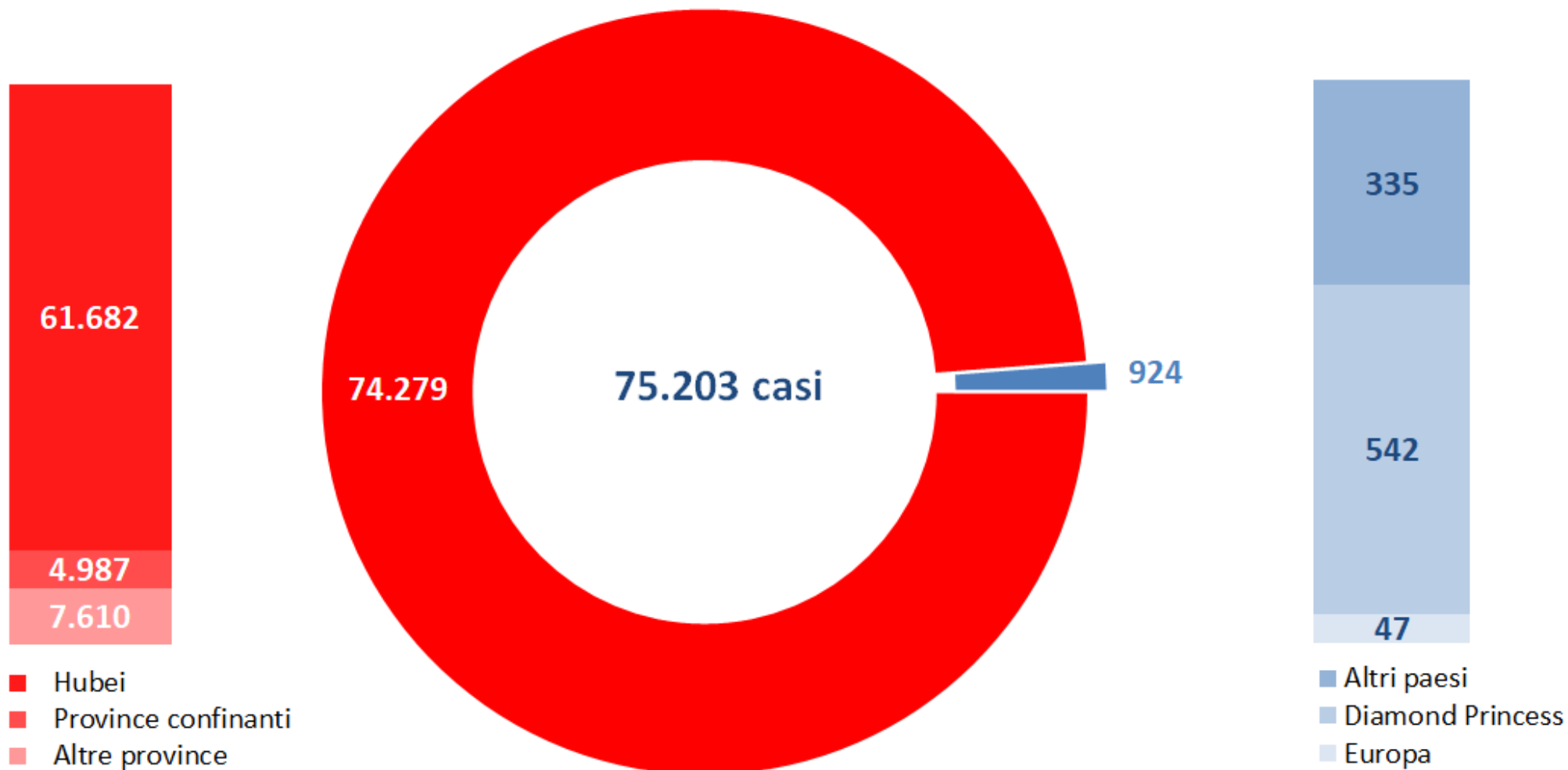
Data source: WHO, National Health Commission of the People's Republic of China  
Map production: WHO Health Emergencies Programme  
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### Countries with confirmed cases

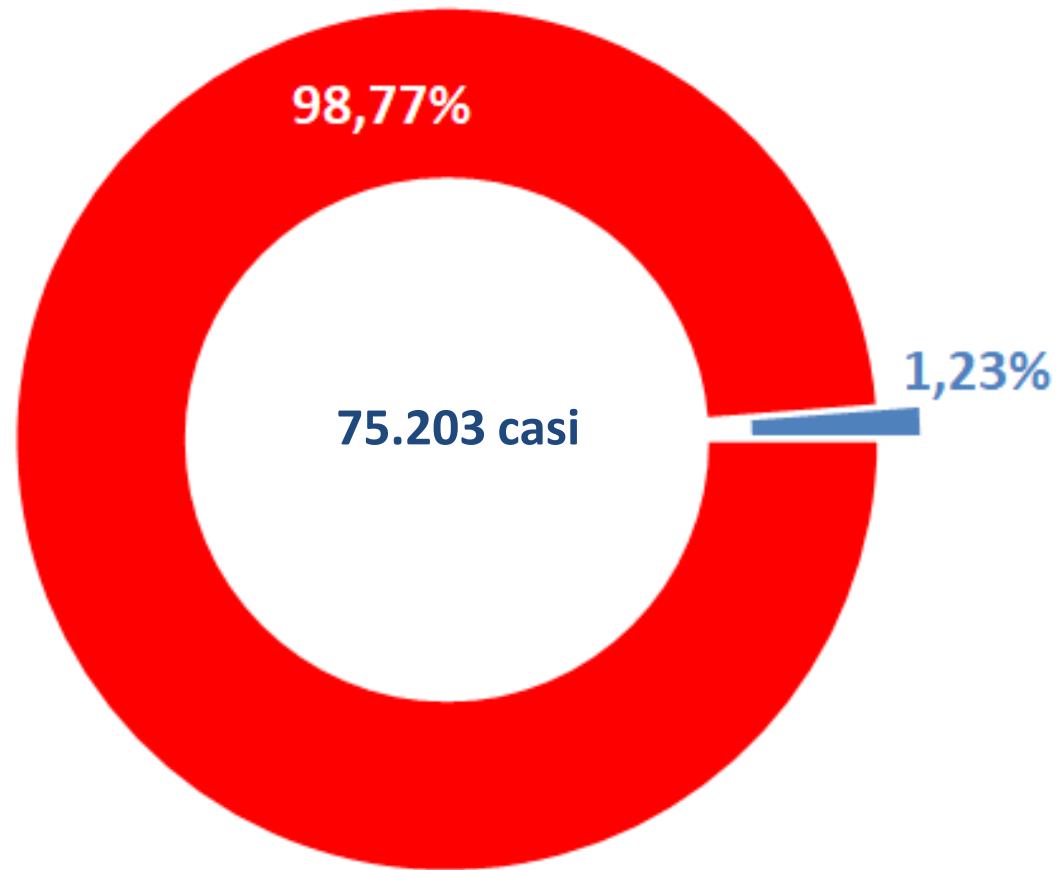
China : 74.279 Cases
International conveyance (Diamond Princess) : 621 Cases
Singapore : 84 Cases
Japan : 73 Cases
Republic of Korea : 51 Cases
Thailand : 35 Cases
Malaysia : 22 Cases
Germany : 16 Cases
Viet Nam : 16 Cases
Australia : 15 Cases
United States of America : 15 Cases
France : 12 Cases
United Arab Emirates : 9 Cases
United Kingdom : 9 Cases
Canada : 8 Cases
India : 3 Cases
Italy : 3 Cases
Philippines : 3 Cases
Russian Federation : 2
Countries, territ...

## + 1.006 casi

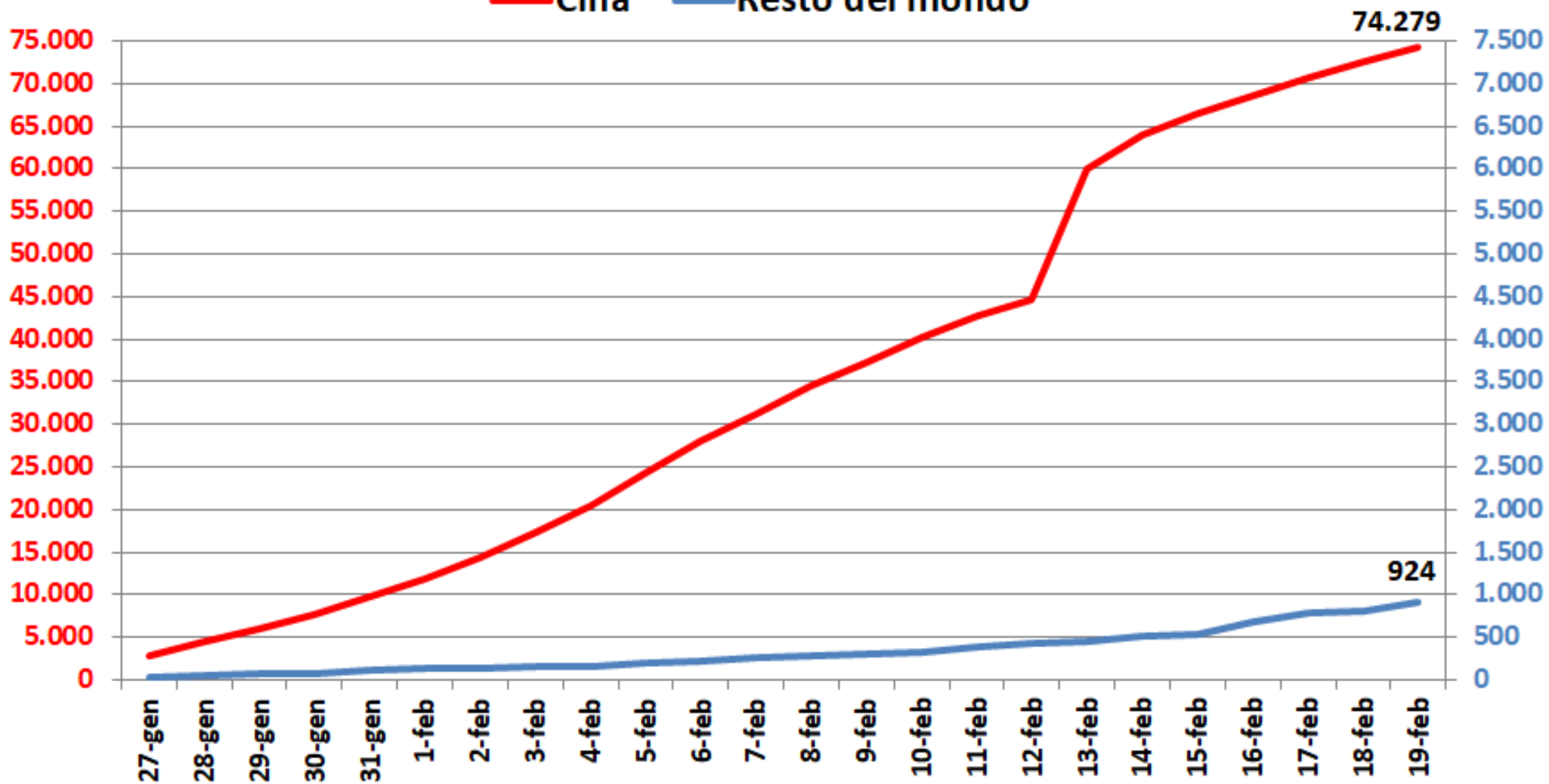
■ Cina ■ Resto del mondo



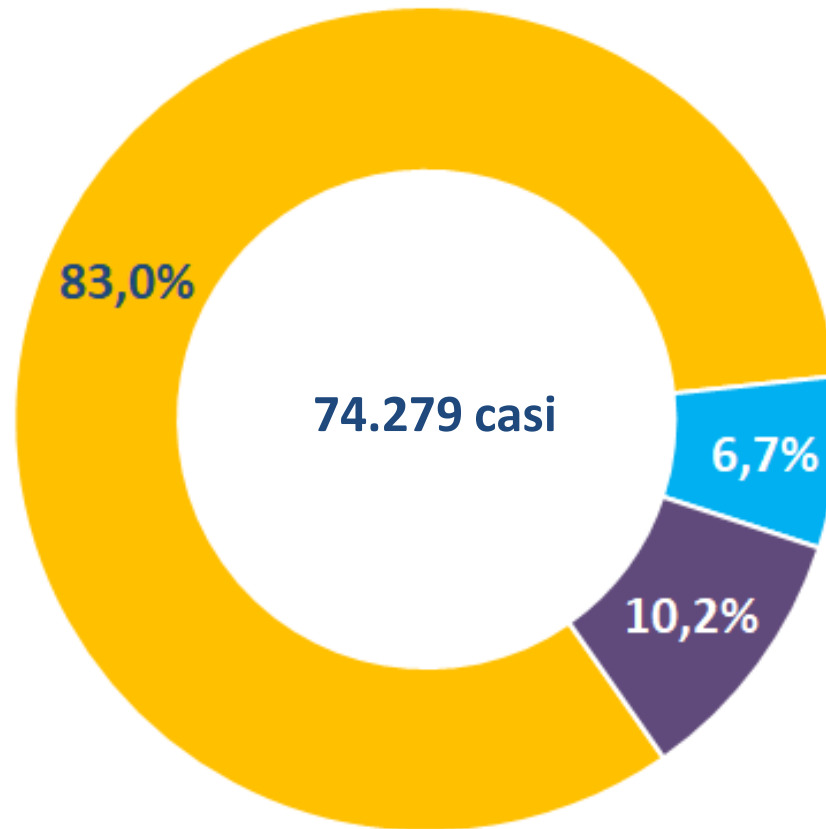
■ Cina ■ Resto del mondo



Cina Resto del mondo

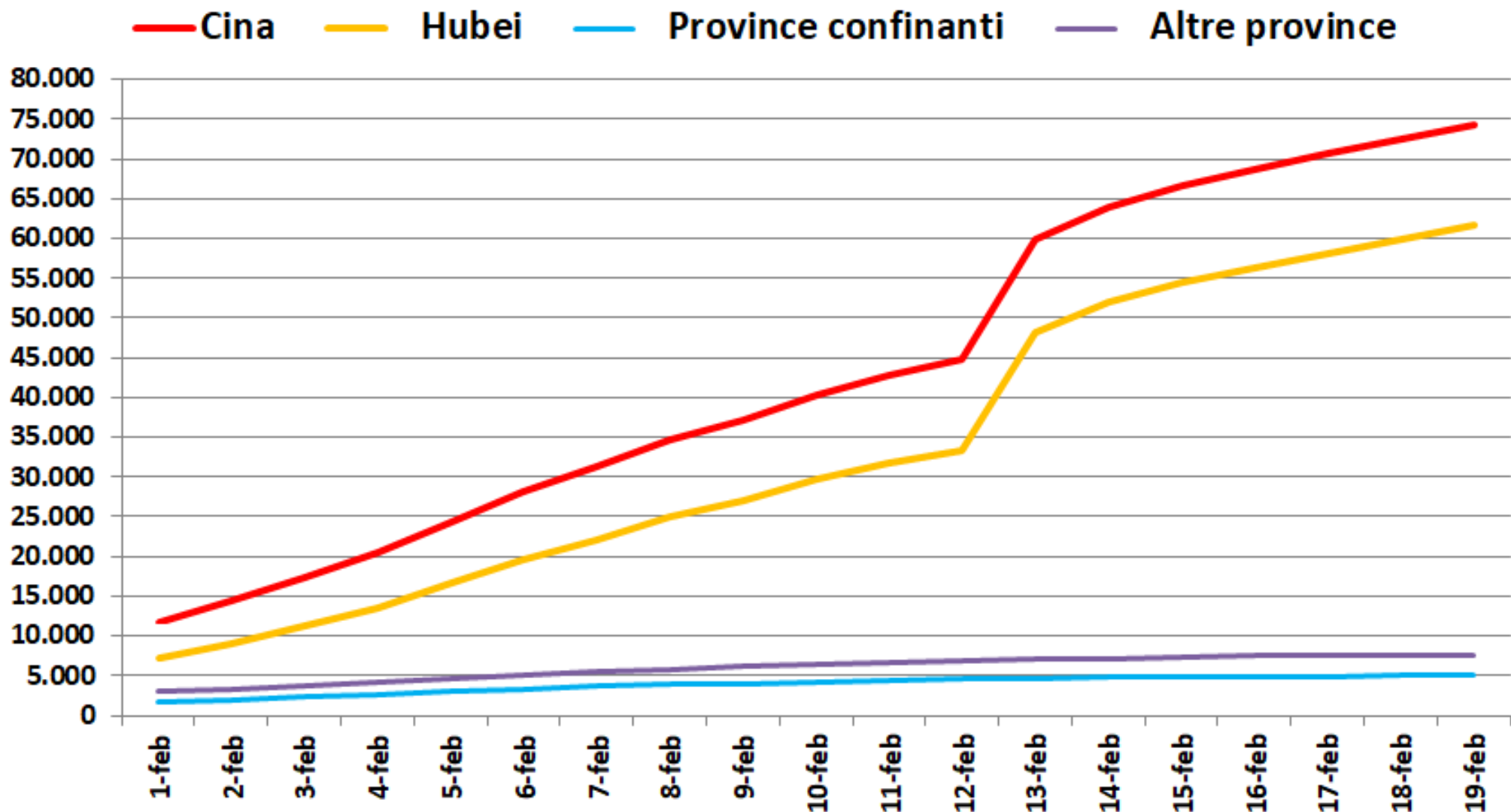


■ Hubei   ■ Province confinanti   ■ Altre province



Dati disponibili dal 1 febbraio 2020

Dal 13 febbraio per la provincia di Hubei il totale dei casi include quelli confermati in laboratorio più quelli diagnosticati clinicamente

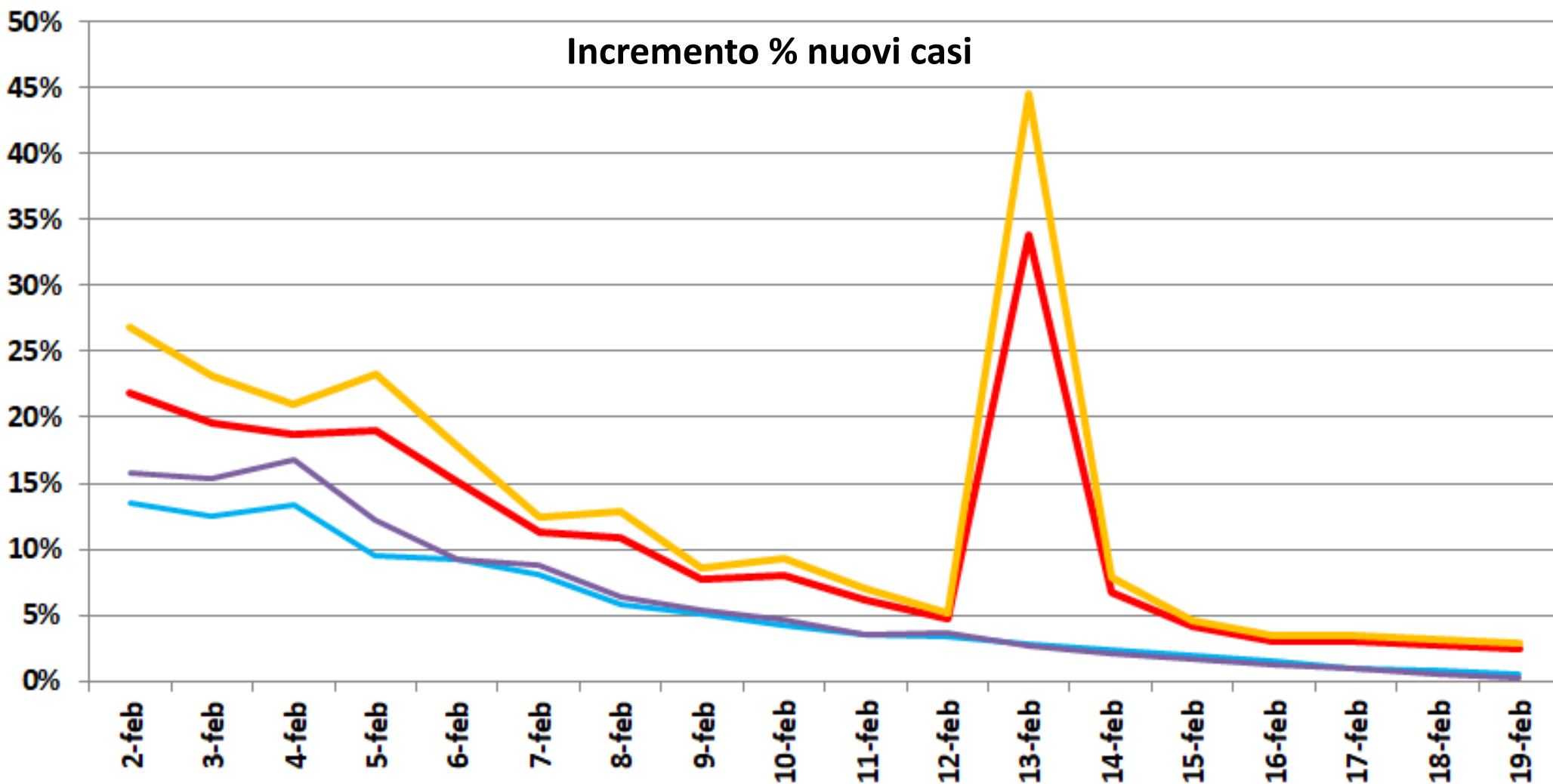


Dal 13 febbraio per la provincia di Hubei il totale dei casi include quelli confermati in laboratorio più quelli diagnosticati clinicamente



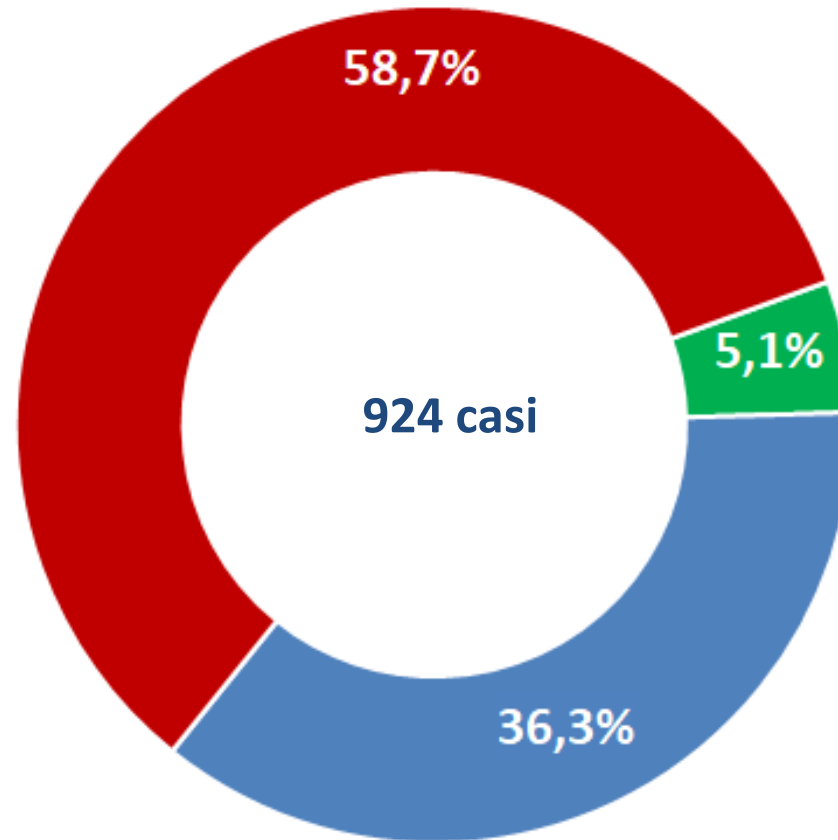
Cina Hubei Province confinanti Altre province

### Incremento % nuovi casi

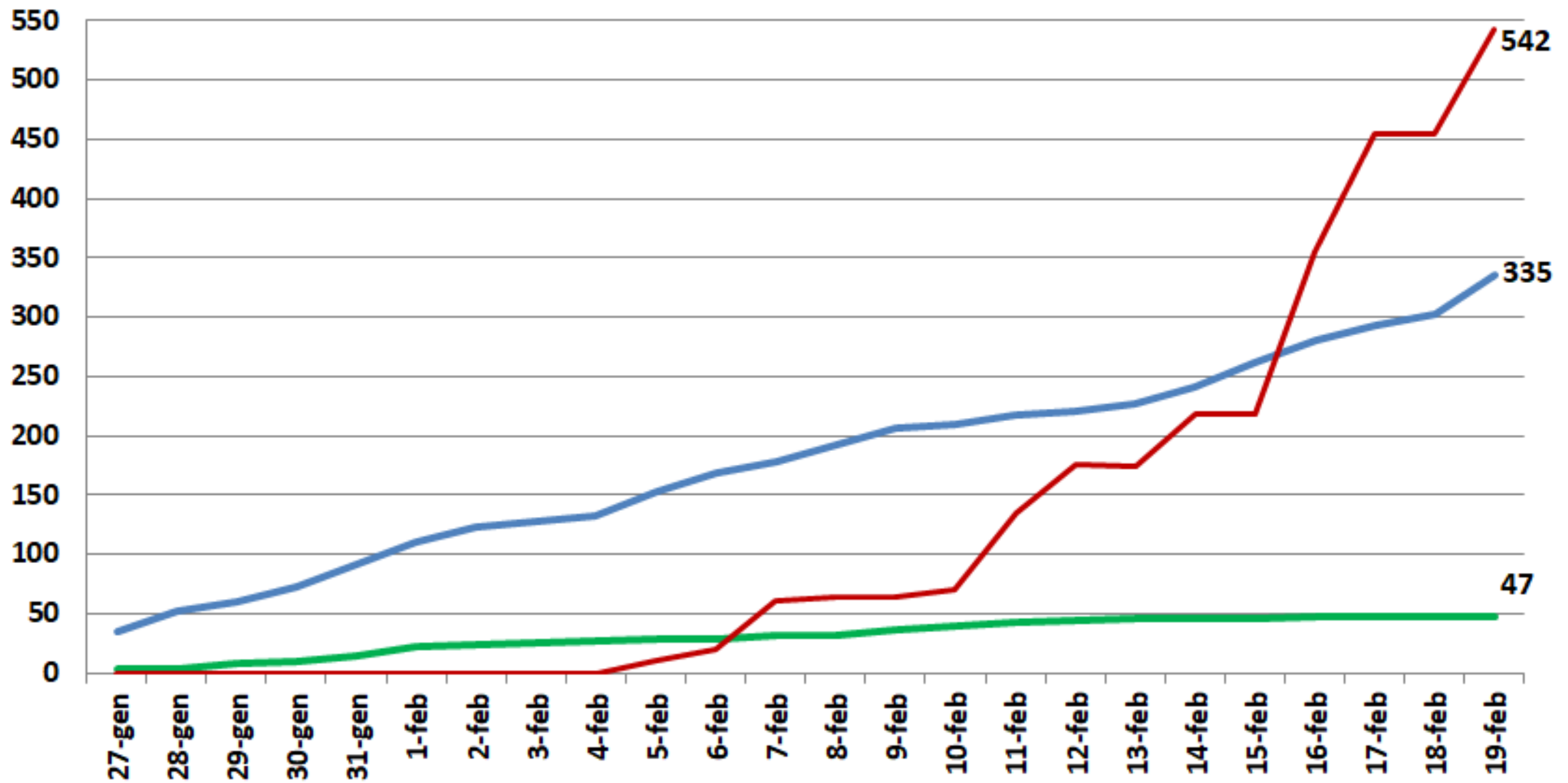


Dal 13 febbraio per la provincia di Hubei il totale dei casi include quelli confermati in laboratorio più quelli diagnosticati clinicamente

■ Europa   ■ Altri paesi   ■ Diamond Princess



Europa Altri paesi Diamond Princess



■ Storia viaggi Cina ■ No storia viaggi Cina



# Outline

- COVID-19 dataroom
- Analisi al 19 febbraio 2020
- **Modello predittivo**



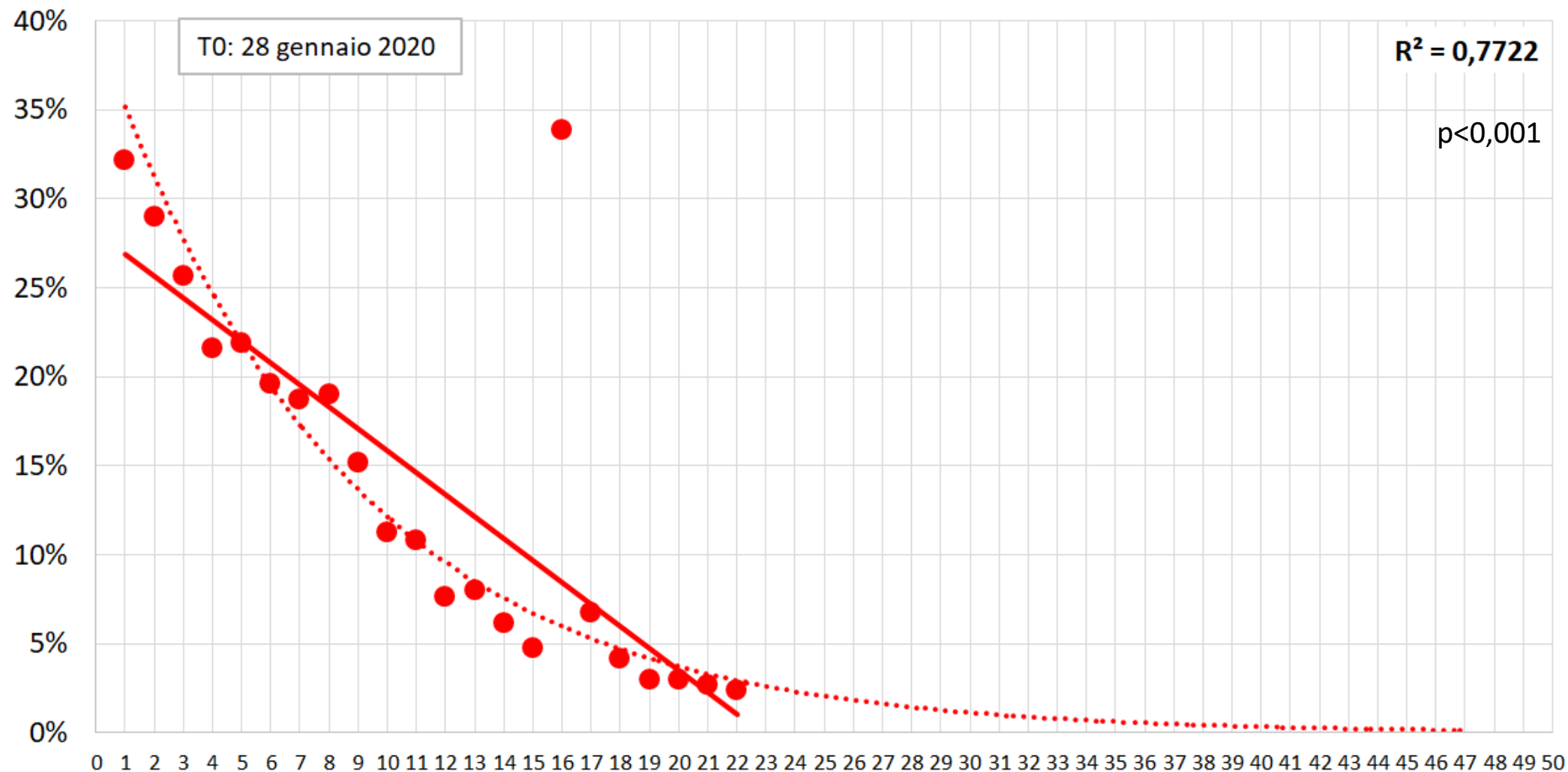
# Modello predittivo

- Elaborato con l'analisi della regressione considerando 2 variabili:
  - **Incremento % dei nuovi casi** (variabile dipendente)
  - **Tempo, in giorni** (variabile indipendente)
- Per ciascun "sottogruppo" geografico i grafici mostrano:
  - Incremento % dei nuovi casi: pallini
  - Trend dei casi: linea continua
  - Proiezione futura dei dati (regressione): linea tratteggiata

# R<sup>2</sup>: coefficiente di determinazione

- Indica la proporzione tra la variabilità dei dati e la correttezza del modello statistico utilizzato.
- Se i valori di R<sup>2</sup> sono prossimi a 1 significa che i regressori predicono il valore della variabile dipendente, mentre se è pari a 0 significa che non lo fanno

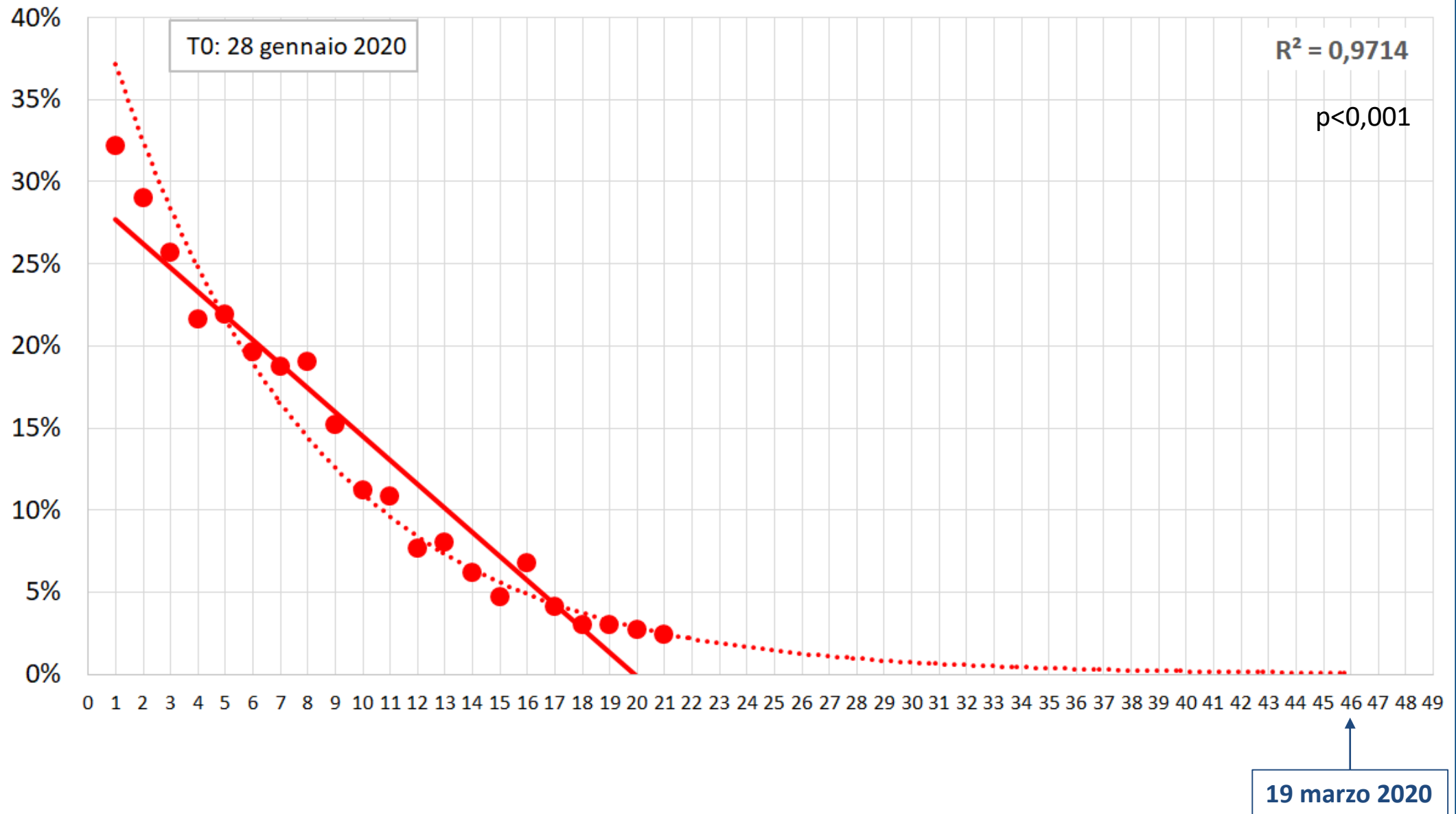
# Cina



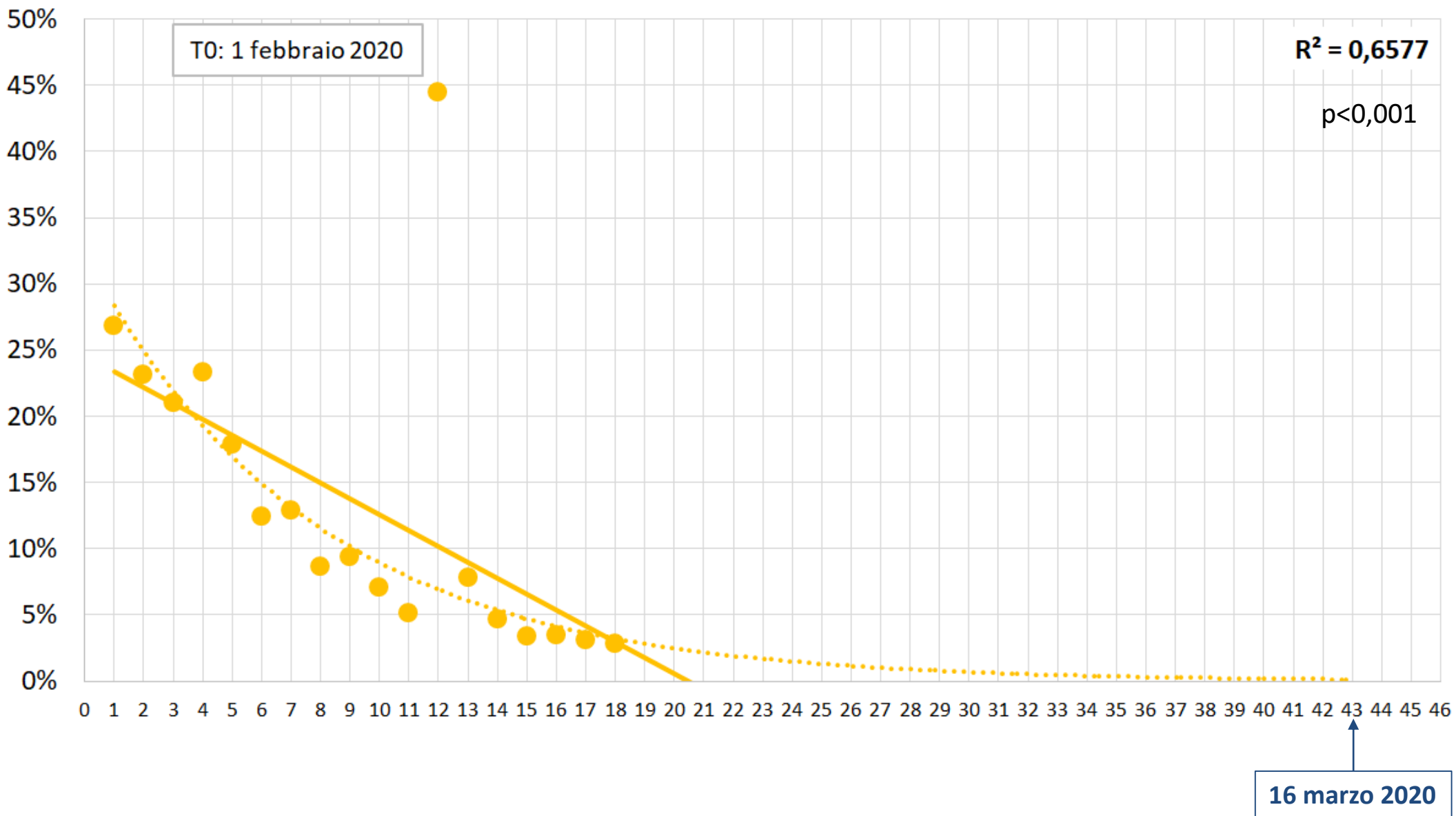
19 marzo 2020



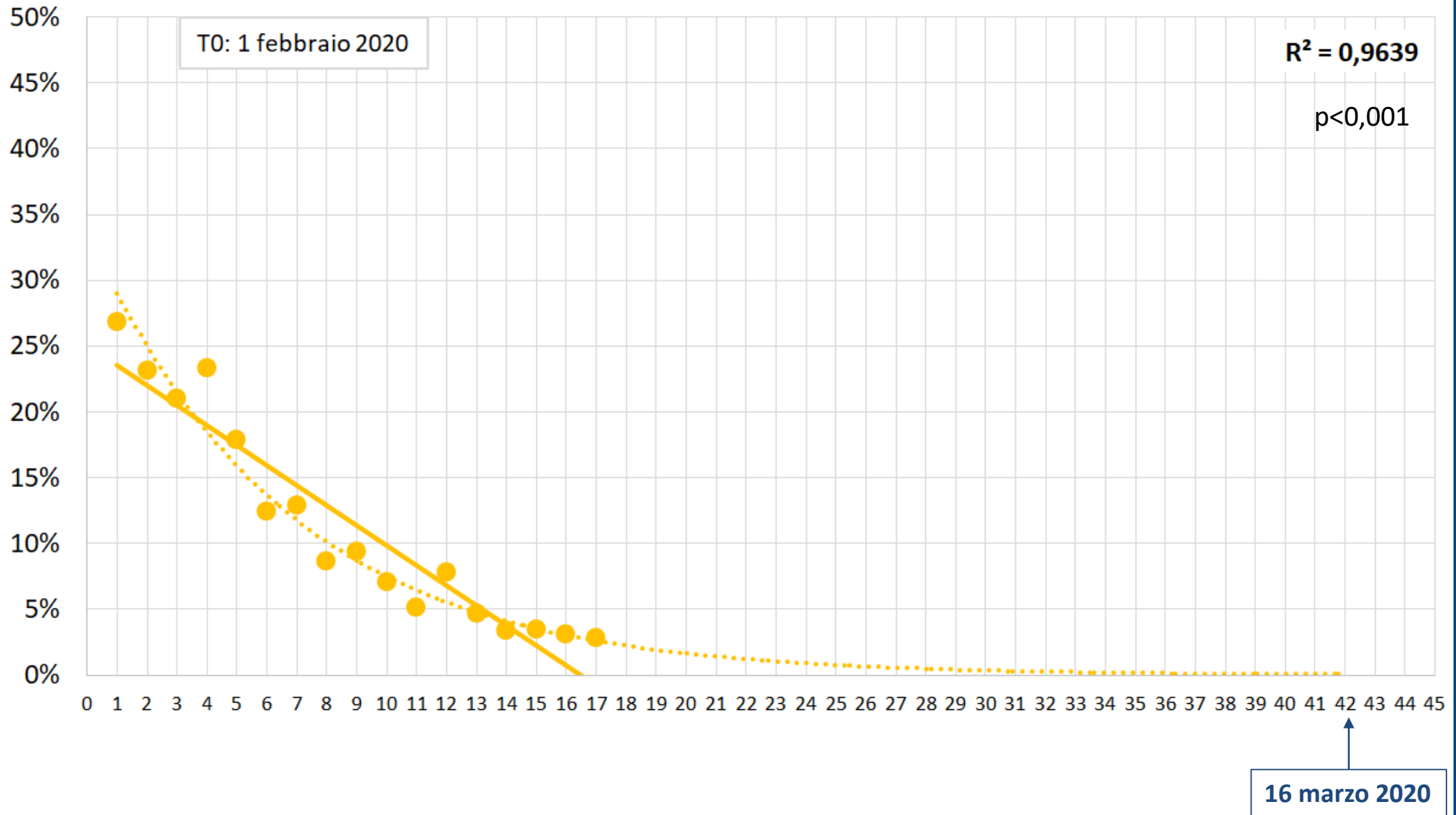
# Cina



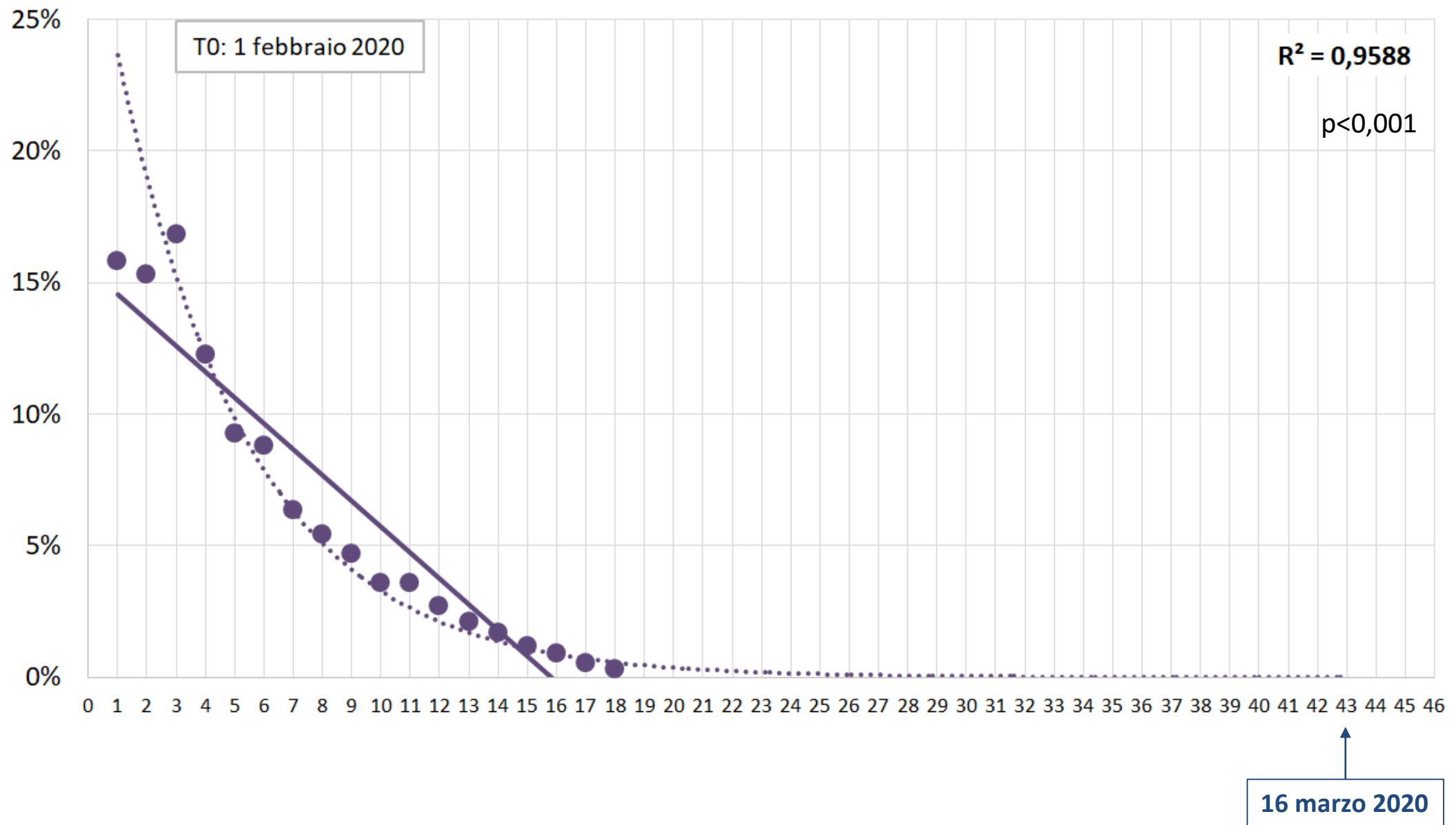
# Hubei



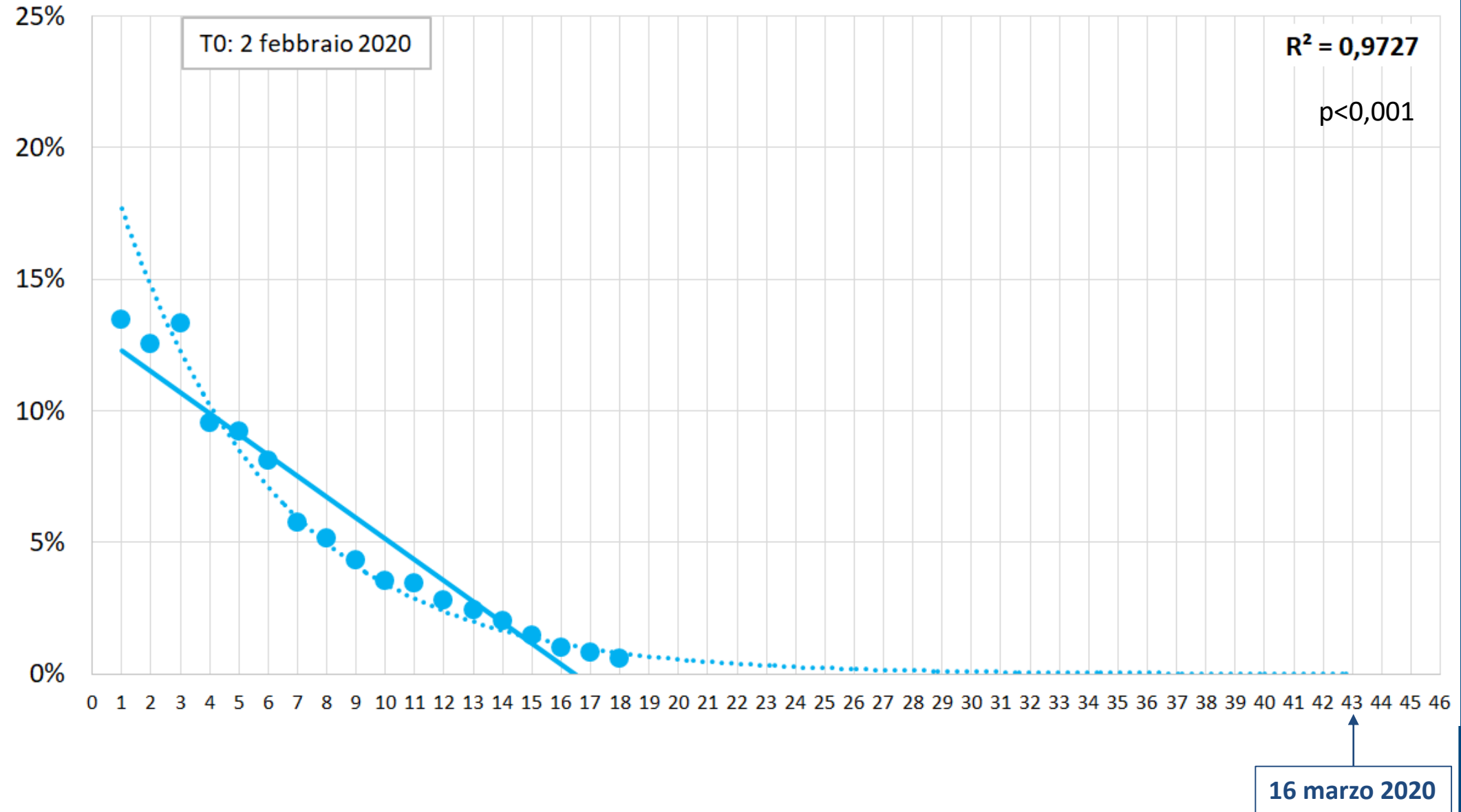
# Hubei



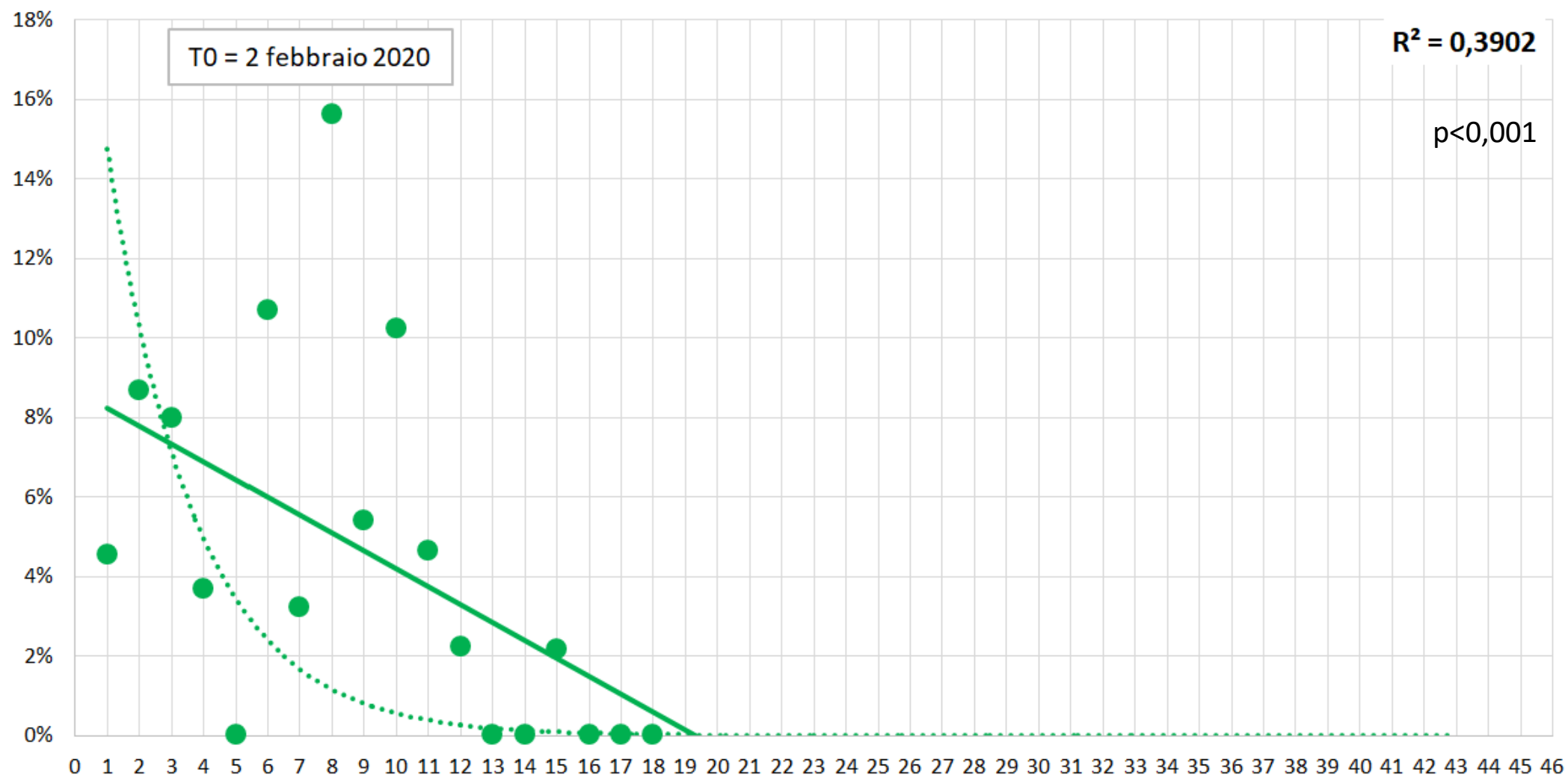
# Cina: province confinanti con Hubei



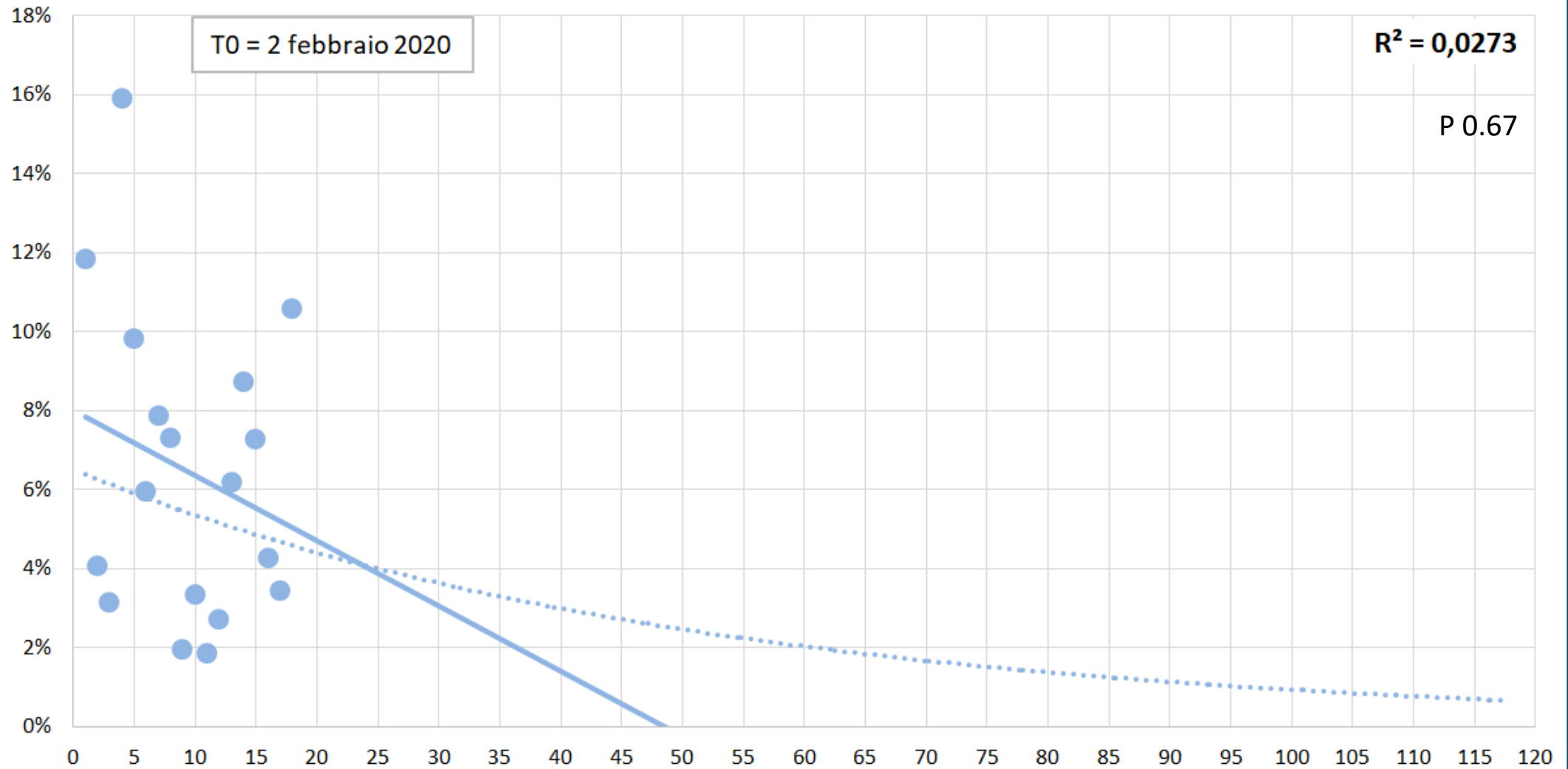
# Cina altre province



# Europa



# Altri paesi

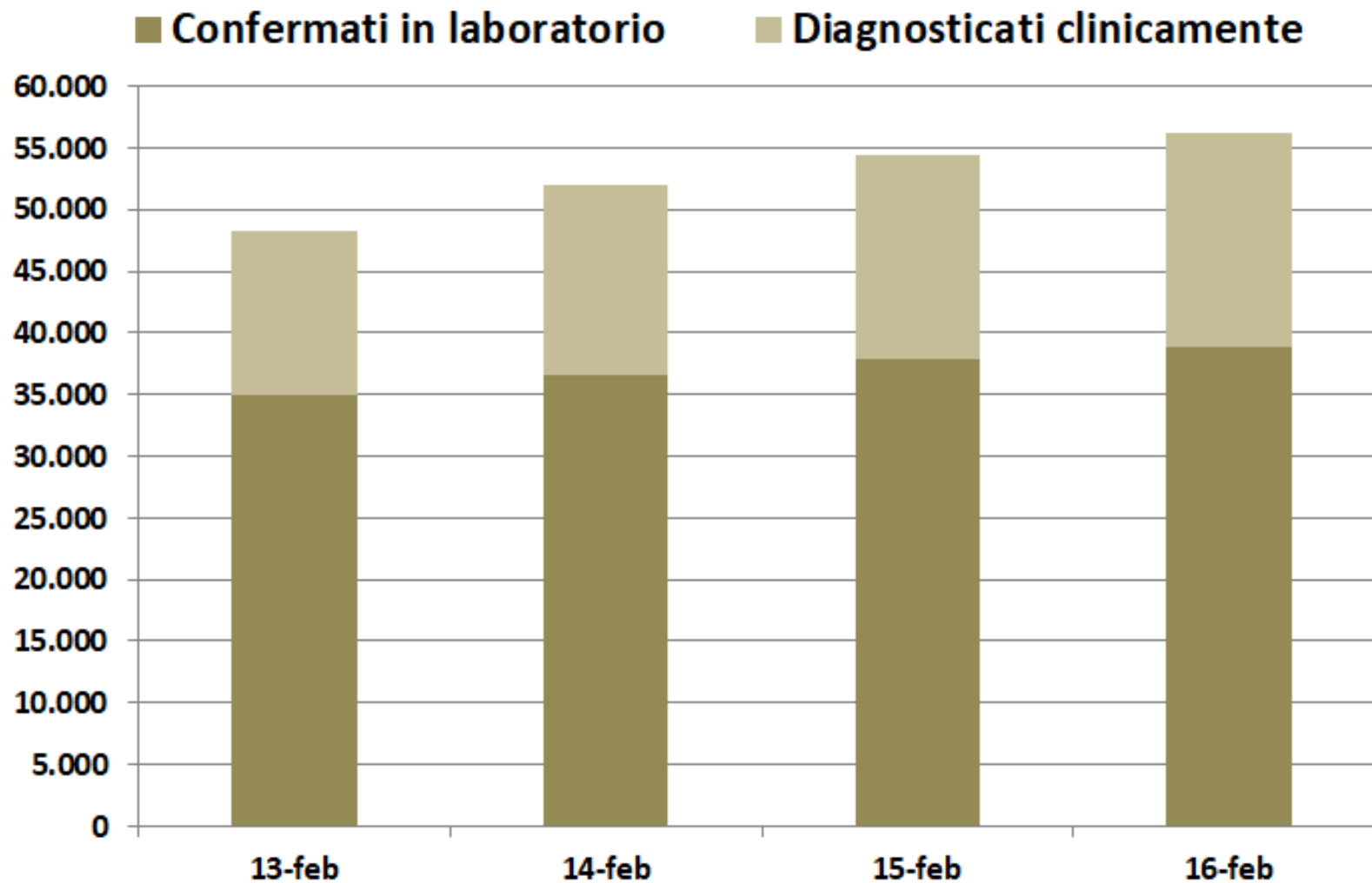


# Modello predittivo

- Tutte le analisi devono essere interpretate con cautela perché usano due sole variabili, le uniche disponibili
- Di conseguenze, altre variabili (nuovi focolai, modifica criteri diagnostici, efficacia misure di prevenzione, etc) potrebbero influenzare il modello predittivo

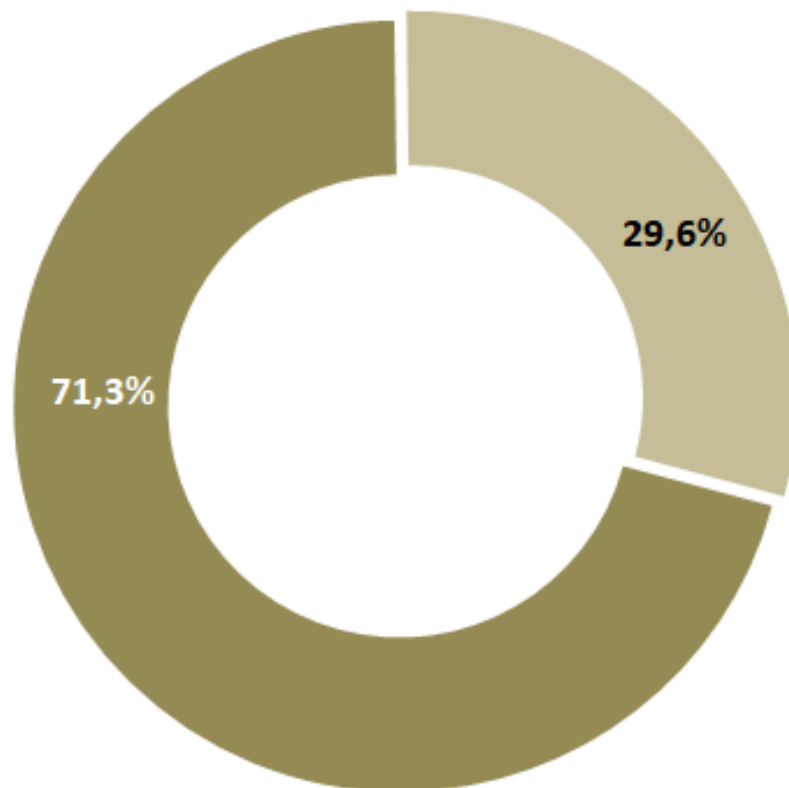


# Variabile criteri diagnostici



# Variabile criteri diagnostici

■ Confermati in laboratorio ■ Diagnosticati clinicamente



# Variabile criteri diagnostici

<b>Impatto modifica dei criteri diagnostici</b>	
<b>Coefficiente variazione (CV)</b>	30%
<b>Totale altre province + CV</b>	9.893
<b>Casi aggiuntivi</b>	2.283

# Open questions

- Eventuali modifiche ai "sottogruppi" geografici
- Modalità e tempi di riclassificazione dei casi della Diamond Princess
- ...

# Simple counts of the number of confirmed cases can be misleading indicators of the epidemic's trajectory.

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Marc Lipsitch, D.Phil., David L. Swerdlow, M.D., and Lyn Finelli, Dr.P.H.



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## Perspective

### **Defining the Epidemiology of Covid-19 — Studies Needed**

Marc Lipsitch, D.Phil., David L. Swerdlow, M.D., and Lyn Finelli, Dr.P.H.

## Types of Evidence Needed for Controlling an Epidemic.

Evidence Needed	Study Type
No. of cases, including milder ones	Syndromic surveillance plus targeted viral testing
Risk factors and timing of transmission	Household studies
Severity and attack rate	Community studies
Severity “pyramid”	Integration of multiple sources and data types
Risk factors for infection and severe outcomes, including death	Case–control studies
Infectiousness timing and intensity	Viral shedding studies