EUROPEJSKIE CENTRUM CZYSTEGO POWIETRZA

REPORT

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EXPOSURE TO SULPHUR DIOXIDE IN POLAND

Review: Task Force for Air Pollution Impact on Health under Ministry of Health

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1. Introduction

1.1. Sulphur dioxide characteristics

Sulphur dioxide (SO_2) is one of the most common gaseous air pollutants. It is a transparent gas with a characteristic pungent odour that easily irritates the respiratory tract. SO_2 is soluble in water and easily undergoes chemical reactions, including oxidation. It is toxic for people and animals, it also has a negative impact on plants, including agricultural crops.

SO_2 is one of the components of the so-called winter smog – a type of severe air pollution characteristic for the heating season. This is due to the fact that the main source of SO_2 emissions is the combustion of fossil fuels – especially solid ones (hard coal, lignite) which are naturally polluted with sulphur compounds (its content ranges from 0.5 to 5% in the case of hard coal, but in extreme cases it can exceed 10% (Chou, 2012[1])). During the combustion process, sulphur compounds are oxidized to sulphur oxides, which refers to SO_2 in particular. SO_2 also comes from industrial activity such as the processing of mineral ores rich in sulphur (e.g. copper ore) and from the combustion of sulphated heavy oil used as marine fuel. Over 95% of SO_2 in the air comes from anthropogenic emissions, while volcanic eruptions are the most important among natural sources.

Sulphur dioxide undergoes oxidation and reacts with water forming sulphuric acid which then becomes one of the main components of acidic rainfall that causes significant damage to ecosystems, especially to forests.

According to official national emissions inventory, 581.5 thousand tonnes of SO_2 were emitted in Poland in 2016, 44.9% of which came from the professional power sector, 29.8% from household fuel combustion and 22.3% from industrial processes.

1.2. Sulphur dioxide as the precursor of secondary particular matter

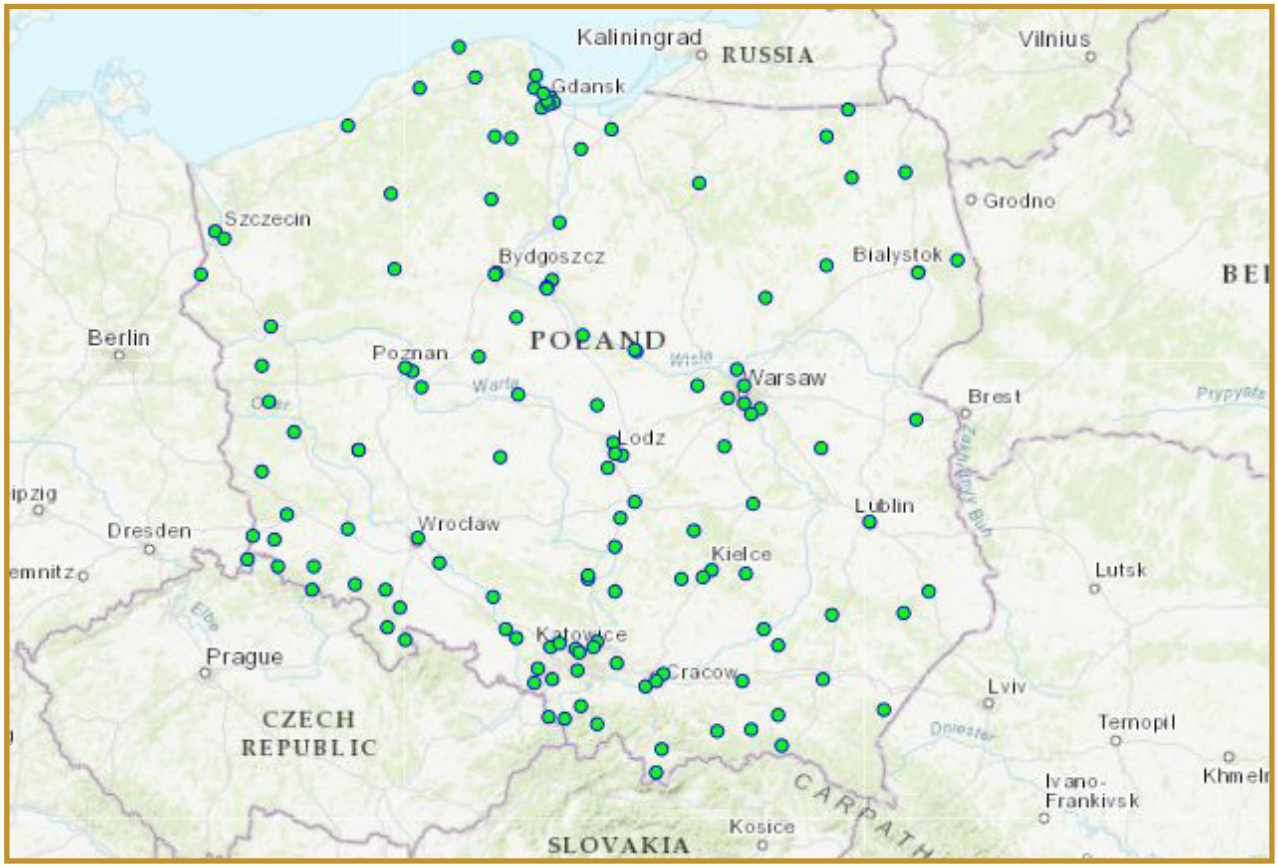
As mentioned earlier, SO_2 undergoes a number of chemical reactions and those resulting in its transformation into sulphate aerosol particles are among the most important ones. In other words, gaseous SO_2, by reacting with other substances in the air, contributes to the formation of particulates which are contained in particulate matter $PM_{2.5}$ (the so-called secondary particular matter). Particulate matter observed and measured in the air is a mixture of primary particulates (emitted directly from various sources) and secondary particulates (formed during chemical reactions with other pollutants, including SO_2). For instance, the share of secondary $PM_{2.5}$ in Warsaw is over 40% and of the sulphur aerosol itself – a dozen or so per cent. These are quite significant quantities, which means that a reduction of SO_2 emissions also contributes to a noticeable reduction of particulate matter concentrations. It should be noted that chemical reactions transforming gaseous SO_2 into secondary particulate matter in the form of sulphates are quite fast and take between several hours to a few days.

1. Chou Ch.-L. (2012). Sulfur in coals: A review of geochemistry and origins. International Journal of Coal Geology, 100, 1-13

1.3. Monitoring of sulphur dioxide concentrations in Poland

SO_2 is one of the pollutants that are obligatorily measured as part of the routine monitoring of air quality in Poland. SO_2 concentrations are currently monitored at 129 measurement stations (including 126 automatic and 3 manual ones) the location of which is presented on the map below.

Figure 1. Location of SO_2 monitoring stations in Poland. Source: http://powietrze.gios.gov.pl.



Most of the stations are used for the monitoring of urban background (94), the remaining ones are located at communication (4) and industrial sites (5) as well as in rural and suburban areas (26). Automated measurements are taken on an hourly basis, whereas manual measurements on a 24-hour basis. As recommended by the European Commission, SO_2 concentrations are measured by ultraviolet fluorescence.

1.4. Limit values in Poland and WHO guideline values

The air quality standards applied in Poland in relation to human health protection are consistent with the limit values laid down in the CAFE Directive (Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe) transposed in the Regulation of the Minister of Environment of 24 August 2012 on levels of certain substances in ambient air (Journal of Laws of 2012, item 1031). The relevant SO_2 values are presented in Table 1 below. Values recommended by the World Health Organisation (WHO) are also presented for comparison purposes.

Table 1. Limit values in Poland and WHO guideline values for sulphur dioxide

Averaging time	Limit values	Number of exceedances allowed per year	WHO guideline value
24 hours	125 µg/m^3	3	20 µg/m^3
1 hour	350 µg/m^3	24	-
10 minutes	-	-	500 µg/m^3

As shown above, both a legally binding air quality standard and a WHO guideline value exist only for concentrations averaged over 24 hours. It should be pointed out that SO_2 concentration recognized as "safe" for the human health by the World Health Organisation (20 µg/m^3) is over six times lower than the EU standard (125 µg/m^3) which can additionally be exceeded on three days per year. What is more, the WHO holds the opinion – based on numerous studies – that even very short-term exposures to high concentrations of SO_2 may cause adverse health effects in people suffering from asthma – hence the additional recommendation that that a value of 500 µg/m^3 should not be exceeded over averaging periods of 10 minutes.

2. Assessment of the exposure of Poles to sulphur dioxide

2.1. Methodology

The exposure of Poles to sulphur dioxide was assessed by analysing the air quality data provided by the Chief Inspectorate of Environmental Protection (CIEP), data concerning the population of individual municipalities (Local Data Bank, Central Statistical Office[2]) and population density per a 1 km grid cell on the basis of the 2011 national census (Geostatistics Portal, Central Statistical Office[3]).

In the case of the assessment carried out on the basis of measurement results, files containing data on 1-hour concentrations (or 24-hour concentrations in the case of 3 manual stations) gathered at all measurement stations from 2010 – 2017 were downloaded. 1-hour data were averaged in order to obtain average daily concentrations. Stations located at communication and industrial sites were excluded from the analysis. As for the remaining ones, it was assumed that each station is representative for the whole population of the municipality in which it is located. Under this assumption it may be concluded that 35 – 40% of the population of Poland is covered by SO_2 monitoring.

2. https://bdl.stat.gov.pl/BDL/start
3. https://geo.stat.gov.pl/

In the case of assessment based on modelling results, spatial data from the modelling of SO_2 concentrations in 2015 were used – the results concerning the fourth highest daily average value (4 d max) and the twenty fifth highest hourly average value (25 h max) per a 500 m square grid cell. Superimposing these maps on the population density map (modified in order to show the population figures for 2015) and on the map of the spatial extent of municipalities made it possible to determine the degree of exposure of the whole population of Poland and to identify municipalities with high SO_2 concentrations constituting a potential threat to the health of their residents.

2.2. Assessment results based on measurement data

The analysis was based on 24-hour average SO_2 concentrations for which three thresholds indicated by the WHO were used:

- interim target 1 [IT 1] = 125 µg/m^3
- interim target 2 [IT 2] = 50 µg/m^3
- WHO guideline value [WHO] = 20 µg/m^3

Interim target values were proposed by the WHO due to the fact that achieving the 20 µg/m^3 target in the short term may prove too challenging, especially for some countries (WHO, 2005[4]). Since the WHO does not indicate an acceptable number of exceedances of the proposed 24-hour average concentrations per year, the criterion of 10% was applied. Table 2 below shows what percentage of the population (covered by SO_2 monitoring) was exposed, in a given year, to SO_2 concentrations of which at least 10% exceeded a given threshold value.

Year	Population covered by SO_2 monitoring	% of the monitored population exposed to concentrations in which the 90th percentile exceeds 125 µg/m^3 [IT1]	% of the monitored population exposed to concentrations in which the 90th percentile exceeds 50 µg/m^3 [IT2]	% of the monitored population exposed to concentrations in which the 90th percentile exceeds 20 µg/m^3 [WHO]
2010	12953164	0%	6,7%	48%
2011	12868555	0%	0,2%	33%
2012	13487872	0%	1,3%	36%
2013	13365456	0%	0,1%	26%
2014	13443406	0%	0,1%	18%
2015	13533999	0%	0,1%	15%
2016	13368942	0%	0%	12%
2017	13385804	0%	0%	13%

Table 2. Assessment of the population's exposure to sulphur dioxide over the period 2010 – 2017 on the basis of measurement data obtained from the air quality monitoring network used in Poland. Source: own study based on CIEP data.

4. WHO (2005). Air quality guidelines - global update 2005. Report on a Working Group meeting, Bonn, Germany 18-20 October 2005. World Health Organization, Regional Office for Europe, Copenhagen

As presented above, IT1 has not been exceeded in Poland since 2010, and in the last few years neither has IT2. A significant improvement can be observed in the case of the WHO guideline value (20 µg/m^3): nearly half of the monitored population was exposed to concentrations exceeding this level in 2010, in 2013 it was about one fourth of the population and over the period 2016 – 2017 the share dropped to about 12 – 13%.

This downward trend indicates a significant improvement in the quality of air in terms of SO_2 concentration and, consequently, a decrease in the level of adverse health effects in the population exposed to this pollutant. However, over 1.7 million people (in the monitored population) are still exposed to concentrations higher than 20 µg/m^3 for at least 10% of the year. What is more, it should be pointed out that nearly two thirds of the population of Poland live in areas in which SO_2 monitoring is not carried out.

As mentioned earlier, the vast majority of SO_2 measurement stations are located in cities where district heating is available (at least partly). In addition, urban population is usually better off than residents of rural areas. The latter ones are much more likely to heat their homes with lower quality fuels with high sulphur content. Therefore, local SO_2 concentrations which are not monitored may potentially be much higher.

2.3. Assessment results based on modelling

The analysis of modelling results for 2015 shows that SO_2 standards currently in force are met in most parts of the country (see Table 3 and Figures 2, 3). In the case of the maximum 24-hour concentration (125 µg/m^3) which can be exceeded up to three times per year, only one municipality – Dąbrowa Górnicza – fails to meet the standard and only 0.007% of the country's population is exposed (Figure 2). In the case of maximum 1-hour concentration (350 µg/m^3) which can be exceeded up to 24 times per year, the standard is not met only in some parts of three municipalities and 0.011% of the population is exposed (Figure 3).

2015	Number of people	% of the population of Poland	Comments
Population exposed to average 24-hour SO_2 concentrations exceeding 125 µg/m^3 more than 3 times per year	2765	0,007%	Exceedances recorded only in 1 municipality – Dąbrowa Górnicza; 2% of residents exposed
Population exposed to 1-hour SO_2 concentrations exceeding 350 µg/m^3 more than 24 times per year	4221	0,011%	Exceedances recorded in 3 municipalities – Dąbrowa Górnicza, Tarnów and Staszów; 2.1%, 1.1% and 0.2% of residents exposed respectively
Population exposed to average 24-hour SO_2 concentrations exceeding 20 µg/m^3 more than 3 times per year	12736840	33,30%	Exceedances recorded in 773 municipalities; 0.1 – 100% of residents exposed

Table 3. Assessment of the population's exposure to sulphur dioxide in 2015 on the basis of data obtained from mathematical modelling of air pollutant dispersion. Source: own study based on CIEP data.

Figure 2. Map of exposure to 4d max SO_2 concentrations exceeding 125 µg/m^3 in 2015.
Source: own study based based on CIEP data.

Figure 3. Map of population's exposure to 25h max SO_2 concentrations exceeding 350 µg/m^3 in 2015.
Source: own study based on CIEP data.

The situation is much worse in the case of exposure to concentrations exceeding the WHO guideline value[5] (24-hour average concentration above 20 µg/m³) – see Figure 4.

Over 12.7 million people, i.e. one third of the whole population of Poland, are exposed to such high concentrations. The problem refers to 773 municipalities (full list in the Annex). The situation in these municipalities varies – in some of them only a few percent of the population are exposed, whereas in as many as 87 of them the problem affects 100% of residents.

The most affected municipalities are located in three voivodships (śląskie, opolskie and małopolskie), whereas the problem is practically non-existent in warmińsko-mazurskie, lubuskie and lubelskie voivodships.

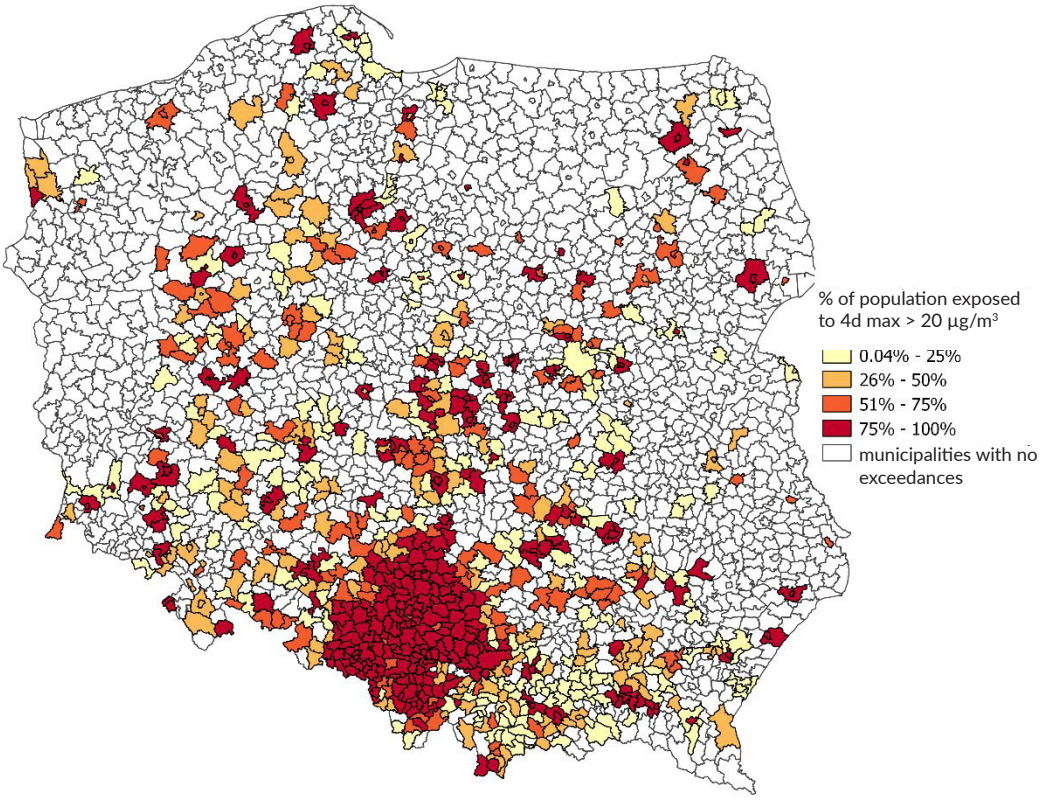


Figure 4. Map of exposure to 4d max SO_2 concentrations exceeding 20 µg/m³ in 2015 taking into account the share of the exposed population in individual municipalities. Source: own study based on CIEP data.

It should be stressed that emission database is the largest source of uncertainty as to the modelling results. Poland still does not have a reliable source of such data and the available inventories are often characterised by underestimations, which was particularly highlighted by the Supreme Audit Office in its 2014 report[6]. Therefore, Poland's exposure to high concentrations of SO_2 may be even greater than it results from this analysis.

5. Due to the nature of the available spatial data, it was only possible to analyse the fourth highest average annual value, which means that the 20 µg/m³ level was reached in the analysed areas on at least 4 days per year.
6. Supreme Audit Office (2014). Information on audit results. Air quality protection. Ref. No. LKR-4101-007-00/2014.

3. Effects of exposure to sulphur dioxide on human health

3.1. Overview of research results prepared as part of the WHO REVIHAAP project (WHO, 2013[7])

Studies of short-term exposure to SO_2 reveal that this pollutant contributes to reductions in spirometric parameters (FEV1) and increases in airway resistance. This particularly applies to asthmatics, of whom 5 – 30% showed a worsening of symptoms during 5 – 10 minutes of exercise in a room where SO_2 concentration ranged from 500 to 800 µg/m^3. Symptoms of inflammatory responses were also observed, such as cough, increased secretion of mucus in the airways and irritation of the mucous membrane of the eye.

Numerous time-series analyses indicated that SO_2 concentrations can be linked with the number of daily hospital admissions and mortality rates, nevertheless, the results obtained by individual authors differ quite significantly. Multicity studies showed that the increase in relative mortality risk per 10 µg/m^3 increment in SO_2 concentrations is 0.2 – 3%. Associations observed in some other studies were statistically insignificant or inconsistent after adjusting the model for other pollutants. According to the United States Environmental Protection Agency (EPA), however, the results obtained so far are sufficient to confirm a positive association between short-term exposure to SO_2 concentrations and mortality risk.

The results are clearer as for the association between SO_2 concentrations and hospital admissions. In the case of respiratory admissions, the risk was estimated at 1.51% per 10 µg/m^3 increment in SO_2 concentration for the general population and at 2.65% for children with asthma. The risk of cardiovascular admissions was estimated at 0.96% per 10 µg/m^3 increment in SO_2 concentration.

Studies also indicate a relationship between prenatal exposure to SO_2 and preterm birth, some authors have also found an association between SO_2 and sudden infant death syndrome.

Toxicological tests carried out on animals indicate that acute exposure to SO_2 at concentrations of 250 – 300 µg/m^3 may augment inflammatory and allergic responses. Analyses of long-term exposure have not defined an association between SO_2 and permanent changes in lung morphology or function.

7. WHO (2013). Review of Evidence on Health Aspects of Air Pollution - REVIHAAP Project Technical Report. World Health Organization, Regional Office for Europe, European Centre for Environment and Health, Bonn

Annex

List of municipalities in which average 24-hour concentrations of SO_2 exceeded 20 µg/m^3 at least four times (including the share of the affected population). Source: own study based on CIEP and CSO data.

(1) – urban municipality; (2) – rural municipality; (3) – urban-rural municipality.

No.	Name of municipality	Population	% of affected population
1	Aleksandrów Kujawski (2)	11684	100,00
2	Aleksandrów Łódzki (3)	30645	94,51
3	Alwernia (3)	12684	45,83
4	Andrychów (3)	43957	94,23
5	Augustów (1)	30400	85,35
6	Babice (2)	9073	35,73
7	Baborów (3)	6151	37,86
8	Belsk Duży (2)	6596	13,17
9	Bełchatów (1)	58667	100,00
10	Bełchatów (2)	10857	30,73
11	Bestwina (2)	11405	100,00
12	Będzin (1)	57900	69,18
13	Biała Rawska (3)	11473	0,96
14	Białe Błota (2)	20161	54,63
15	Białobrzegi (3)	10407	65,62
16	Białogard (1)	24437	58,45
17	Biały Dunajec (2)	7112	63,32
18	Białystok (1)	295981	0,12
19	Biecz (3)	16969	1,03
20	Bielawa (1)	30652	70,81
21	Bielsk Podlaski (1)	26075	84,43
22	Bielsko-Biała (1)	172591	93,43
23	Bierawa (2)	7866	7,40
24	Bieruń (1)	19597	97,84
25	Bierutów (3)	10112	48,58
26	Biskupice (2)	9872	12,88
27	Blachownia (3)	13152	86,21
28	Blizanów (2)	9818	24,57
29	Błaszki (3)	14790	8,72
30	Błędów (2)	7620	3,52
31	Bobrowniki (2)	11881	84,40
32	Bochnia (1)	30107	78,92
33	Bodzechów (2)	13597	8,10

34	Bogatynia (3)	23915	61,13
35	Boguchwała (3)	19952	30,11
36	Bojanowo (3)	8831	21,84
37	Bojszowy (2)	7616	51,34
38	Bolesław (2)	7802	100,00
39	Bolesławiec (1)	39373	100,00
40	Bolesławiec (2)	14104	10,11
41	Boronów (2)	3341	100,00
42	Brenna (2)	11105	9,13
43	Brody (2)	11085	1,09
44	Brzeg (1)	36469	61,34
45	Brzeg Dolny (3)	15980	64,50
46	Brzesko (3)	36295	46,73
47	Brzeszcze (3)	21525	100,00
48	Brzeziny (1)	12542	93,67
49	Brzeziny (2)	5616	5,36
50	Brzostek (3)	13167	27,20
51	Brzozów (3)	26611	34,87
52	Brzyska (2)	6498	15,20
53	Buczkowice (2)	11124	100,00
54	Budzów (2)	8814	20,90
55	Buk (3)	12389	52,52
56	Bukowina Tatrzańska (2)	13198	33,44
57	Bukowno (1)	10341	100,00
58	Busko-Zdrój (3)	32767	61,54
59	Bydgoszcz (1)	355645	32,63
60	Bystrzyca Kłodzka (3)	19340	31,60
61	Bytom (1)	170761	89,95
62	Bytów (3)	25198	65,56
63	Charsznica (2)	7573	44,51
64	Chełm (1)	64270	68,23
65	Chełm Śląski (2)	6130	70,90
66	Chełmek (3)	13106	100,00
67	Chełmiec (2)	27689	40,43
68	Chełmno (1)	20215	62,24
69	Chełmno (2)	5820	100,00
70	Chełmża (1)	14854	55,98
71	Chęciny (3)	15014	21,53
72	Chmielnik (3)	11444	34,44
73	Chodel (2)	6717	4,36
74	Chodzież (1)	19199	90,64
75	Chojnice (1)	40043	78,85
76	Chojnice (2)	18442	39,66

77	Chojnów (1)	13825	31,33
78	Chojnów (2)	9550	100,00
79	Chorzów (1)	109757	57,50
80	Chrzanów (3)	47853	97,68
81	Chrząstowice (2)	6816	62,03
82	Chybie (2)	9648	43,12
83	Ciasna (2)	7577	18,36
84	Ciechanów (1)	44506	53,25
85	Ciechanów (2)	6909	96,80
86	Cieszyn (1)	35274	94,54
87	Ciężkowice (3)	11245	7,57
88	Cisek (2)	5750	8,97
89	Czarnków (1)	11029	100,00
90	Czarnków (2)	11377	0,04
91	Czarny Bór (2)	4840	77,83
92	Czchów (3)	9813	19,19
93	Czechowice-Dziedzice (3)	44970	89,40
94	Czeladź (1)	32395	100,00
95	Czermin (2)	7032	5,49
96	Czernichów (2)	8793	100,00
97	Czerwionka-Leszczyny (3)	42024	100,00
98	Czerwonak (2)	27094	7,68
99	Częstochowa (1)	228179	100,00
100	Czorsztyn (2)	7577	10,64
101	Czudec (2)	11788	19,07
102	Daleszyce (3)	15647	13,92
103	Dalików (2)	3854	3,58
104	Damasławek (2)	5558	1,35
105	Dąbrowa Górnicza (1)	122712	100,00
106	Dąbrowa Tarnowska (3)	21138	26,78
107	Dębica (1)	46389	84,66
108	Dębica (2)	25490	33,22
109	Dębowiec (2)	5777	21,85
110	Dłutów (2)	4495	26,59
111	Dobczyce (3)	15168	1,42
112	Dobra (2)	9876	30,37
113	Dobra (Szczecińska) (2)	20866	19,96
114	Dobrodzień (3)	10003	33,44
115	Dobroń (2)	7544	75,13
116	Dopiewo (2)	23453	14,94
117	Drwinia (2)	6535	12,69
118	Drzewica (3)	10725	29,56
119	Dwikozy (2)	8893	20,84

120	Działoszyn (3)	12722	39,20
121	Dzierżoniów (1)	33946	40,05
122	Elbląg (1)	121642	8,69
123	Ełk (1)	60462	61,20
124	Ełk (2)	11270	100,00
125	Frysztak (2)	10537	39,37
126	Garwolin (1)	17214	39,59
127	Gaszowice (2)	9495	53,99
128	Gdańsk (1)	462249	8,64
129	Gdynia (1)	247478	15,45
130	Gierałtowice (2)	11758	100,00
131	Gilowice (2)	6193	100,00
132	Gliwice (1)	183392	96,13
133	Głogów (1)	68666	54,90
134	Głogów (2)	6538	100,00
135	Głogówek (3)	13445	1,24
136	Głowaczów (2)	7301	3,88
137	Głowno (1)	14590	91,17
138	Głubczyce (3)	22776	56,27
139	Głuchołazy (3)	24254	56,83
140	Gniezno (1)	69312	83,88
141	Gniezno (2)	11130	55,15
142	Goczałkowice-Zdrój (2)	6674	90,19
143	Godów (2)	13528	94,91
144	Gogolin (3)	12436	19,97
145	Goleszów (2)	13058	35,39
146	Golina (3)	11880	32,05
147	Golub-Dobrzyń (1)	12849	34,73
148	Golub-Dobrzyń (2)	8621	10,29
149	Gołcza (2)	6153	48,56
150	Gorzyce (2)	20866	81,06
151	Gostynin (1)	18895	55,55
152	Gostynin (2)	12210	31,89
153	Gostyń (3)	27975	59,22
154	Góra (3)	20426	48,16
155	Góra Kalwaria (3)	26244	14,19
156	Góra Świętej Małgorzaty (2)	4431	47,44
157	Górno (2)	13977	2,03
158	Grabica (2)	6101	20,44
159	Grajewo (1)	22171	79,83
160	Grajewo (2)	5946	55,70
161	Grodków (3)	19511	48,20
162	Grodzisk Mazowiecki (3)	45259	64,81

163	Grodzisk Wielkopolski (3)	19636	64,05
164	Gromnik (2)	8807	13,41
165	Gródek nad Dunajcem (2)	9216	18,75
166	Grudziądz (1)	96319	1,35
167	Grudziądz (2)	12363	13,23
168	Grybów (1)	6051	13,96
169	Grybów (2)	24825	41,95
170	Hajnówka (1)	21275	54,89
171	Hażlach (2)	10658	47,07
172	Herby (2)	6905	85,39
173	Hrubieszów (1)	18287	53,21
174	Igołomia-Wawrzeńczyce (2)	7714	3,16
175	Imielin (1)	8846	97,40
176	Irządze (2)	2731	50,86
177	Istebna (2)	11964	18,97
178	Iwanowice (2)	8970	24,80
179	Iwkowa (2)	6320	13,15
180	Jabłonka (2)	18268	2,41
181	Jabłonna (2)	18364	13,06
182	Janów (2)	5971	42,82
183	Janów Lubelski (3)	16200	75,72
184	Jarosław (1)	38360	67,24
185	Jarosław (2)	13169	30,52
186	Jasienica (2)	23344	23,06
187	Jasło (1)	36001	73,96
188	Jasło (2)	16395	82,49
189	Jastrzębie-Zdrój (1)	90283	92,35
190	Jawor (1)	23650	51,31
191	Jaworze (2)	7146	100,00
192	Jaworzno (1)	92847	96,40
193	Jejkowice (2)	4084	100,00
194	Jeleśnia (2)	13401	58,64
195	Jemielnica (2)	7176	28,64
196	Jerzmanowice-Przeginia (2)	10842	100,00
197	Jędrzejów (3)	28584	61,98
198	Jodłowa (2)	5416	10,71
199	Jodłownik (2)	8515	12,14
200	Jordanów (1)	5324	9,22
201	Józefów (1)	20229	59,19
202	Kalety (1)	8642	100,00
203	Kalisz (1)	102808	90,24
204	Kalwaria Zebrzydowska (3)	19897	6,65
205	Kamienica (2)	7803	11,84

206	Kamienica Polska (2)	5631	94,00
207	Kamieniec Ząbkowicki (2)	8316	0,84
208	Kamienna Góra (1)	19663	26,90
209	Kamieńsk (3)	6093	0,05
210	Kamionka Wielka (2)	10140	40,61
211	Karczew (3)	15905	19,61
212	Kartuzy (3)	33400	45,99
213	Katowice (1)	299910	100,00
214	Kazimierz Biskupi (2)	11405	32,56
215	Kazimierza Wielka (3)	16426	41,77
216	Kcynia (3)	13519	0,09
217	Kędzierzyn-Koźle (1)	62399	92,31
218	Kępno (3)	24657	47,26
219	Kęty (3)	34333	89,67
220	Kielce (1)	198046	95,56
221	Kiernozia (2)	3464	20,06
222	Kietrz (3)	11221	50,21
223	Kleczew (3)	10032	15,71
224	Kleszczów (2)	5594	0,13
225	Kluczbork (3)	36406	71,20
226	Klucze (2)	15174	100,00
227	Kluki (2)	4309	19,08
228	Kłobuck (3)	20555	100,00
229	Kłodzko (1)	27656	27,59
230	Kłomnice (2)	13676	78,03
231	Knurów (1)	38741	100,00
232	Kobiór (2)	4918	45,34
233	Kobyłka (1)	21890	59,45
234	Kochanowice (2)	6872	92,11
235	Kocmyrzów-Luborzyca (2)	14942	42,77
236	Kolbuszowa (3)	24891	29,52
237	Koluszki (3)	23636	68,47
238	Kołaczyce (3)	8957	33,62
239	Kołbaskowo (2)	12108	96,87
240	Komorniki (2)	25572	52,58
241	Komprachcice (2)	11111	24,54
242	Koniecpol (3)	9740	67,22
243	Koniusza (2)	8870	2,19
244	Konopiska (2)	10740	87,75
245	Konstancin-Jeziorna (3)	24763	8,21
246	Konstantynów Łódzki (1)	17807	55,56
247	Końskie (3)	36048	66,30
248	Koprzywnica (3)	6823	24,64

249	Korczyna (2)	11109	25,46
250	Kornowac (2)	5139	100,00
251	Koronowo (3)	24211	27,83
252	Korzenna (2)	14242	22,71
253	Kosakowo (2)	12813	4,38
254	Koszarawa (2)	2428	26,19
255	Koszęcin (2)	11859	100,00
256	Kościan (1)	23745	100,00
257	Kościan (2)	15979	7,47
258	Kościelisko (2)	8659	22,65
259	Kościerzyna (1)	23744	92,50
260	Koziegłowy (3)	14390	100,00
261	Kozienice (3)	30164	2,26
262	Kozłów (2)	4715	5,20
263	Kozy (2)	12724	100,00
264	Kraków (1)	761069	96,50
265	Kramsk (2)	11032	6,72
266	Krapkowice (3)	23148	80,36
267	Krasne (2)	10877	11,91
268	Krasocin (2)	10733	7,51
269	Kroczyce (2)	6300	100,00
270	Krosno (1)	46775	85,79
271	Krośniewice (3)	8695	51,44
272	Krotoszyn (3)	40553	65,45
273	Krupski Młyn (2)	3239	45,23
274	Kruszyna (2)	4890	72,45
275	Krzanowice (3)	5820	67,65
276	Krzepice (3)	9248	25,38
277	Krzeszowice (3)	32394	78,55
278	Krzyż Wielkopolski (3)	8775	69,75
279	Krzyżanowice (2)	11328	80,89
280	Ksawerów (2)	7673	26,14
281	Kudowa-Zdrój (1)	10180	84,74
282	Kunów (3)	10018	10,49
283	Kuślin (2)	5573	0,50
284	Kutno (1)	45024	86,41
285	Kutno (2)	8723	92,79
286	Kuźnia Raciborska (3)	11909	97,33
287	Kwidzyn (1)	38650	84,88
288	Kwidzyn (2)	11241	33,00
289	Lanckorona (2)	6148	6,07
290	Legionowo (1)	54172	87,74
291	Legnica (1)	100886	48,17

292	Legnickie Pole (2)	5179	13,92
293	Lelów (2)	4928	34,96
294	Leszno (1)	64559	47,87
295	Lesznowola (2)	24486	53,42
296	Leśnica (3)	7849	45,48
297	Lewin Brzeski (3)	13299	44,88
298	Lębork (1)	35388	75,94
299	Lędziny (1)	16784	92,27
300	Libiąż (3)	22649	91,85
301	Limanowa (1)	15128	75,85
302	Limanowa (2)	24834	14,05
303	Lipnica Murowana (2)	5601	12,59
304	Lipno (1)	14720	68,72
305	Lipno (2)	10757	15,19
306	Lipowa (2)	10474	76,65
307	Lipsko (3)	11348	3,23
308	Liszki (2)	16815	14,38
309	Lubaczów (1)	12304	81,73
310	Lubań (1)	21580	69,89
311	Lubań (2)	6616	100,00
312	Lubartów (1)	22369	67,23
313	Lubartów (2)	11272	35,02
314	Lubawa (1)	10083	76,74
315	Lubawka (3)	11144	0,04
316	Lubin (1)	73352	79,69
317	Lubin (2)	15056	100,00
318	Lublin (1)	340727	2,32
319	Lubliniec (1)	24105	99,51
320	Lubochnia (2)	7211	3,11
321	Lubomia (2)	7932	97,40
322	Luboń (1)	31067	83,08
323	Lutomiersk (2)	8129	15,89
324	Lyski (2)	9600	100,00
325	Łabiszyn (3)	9961	48,36
326	Łańcut (1)	17830	13,49
327	Łańcut (2)	21482	6,14
328	Łapanów (2)	7934	21,31
329	Łapsze Niżne (2)	9237	3,19
330	Łask (3)	27899	72,64
331	Łaziska Górne (1)	22413	54,83
332	Łazy (3)	16038	100,00
333	Łącko (2)	16187	23,25
334	Łęczna (3)	23623	73,50

335	Łęczyca (1)	14512	84,06
336	Łękawica (2)	4454	56,35
337	Łochów (3)	17926	18,38
338	Łodygowice (2)	14054	79,97
339	Łomża (1)	62737	75,01
340	Łopuszno (2)	8989	15,86
341	Łosice (3)	10929	8,88
342	Łososina Dolna (2)	10776	15,41
343	Łowicz (1)	28936	56,29
344	Łowicz (2)	7646	100,00
345	Łódź (1)	700982	21,75
346	Łubniany (2)	9695	2,03
347	Łukowica (2)	9857	2,75
348	Łyse (2)	8438	4,75
349	M,st,Warszawa od 2002 (1)	1744351	14,57
350	Maciejowice (2)	7090	0,47
351	Magnuszew (2)	6796	7,68
352	Maków (2)	5996	24,70
353	Maków Mazowiecki (1)	10006	84,76
354	Maków Podhalański (3)	16351	40,32
355	Malbork (1)	38931	41,36
356	Malbork (2)	4728	100,00
357	Małogoszcz (3)	11670	18,40
358	Marki (1)	30595	17,51
359	Marklowice (2)	5440	76,31
360	Masłów (2)	10602	98,62
361	Maszewo (3)	8789	8,36
362	Medyka (2)	6539	0,06
363	Męcinka (2)	4971	100,00
364	Miasteczko Śląskie (1)	7359	93,75
365	Miastko (3)	19950	32,57
366	Michałowice (2)	11348	14,95
367	Miechów (3)	19832	67,37
368	Miedziana Góra (2)	11260	40,74
369	Miedźna (2)	16175	63,18
370	Miedźno (2)	7606	63,94
371	Mielec (1)	60644	39,75
372	Mieroszów (3)	6992	41,55
373	Mierzęcice (2)	7603	90,10
374	Miękinia (2)	14665	13,77
375	Mikołów (1)	39923	100,00
376	Milanówek (1)	16371	7,64
377	Milicz (3)	24357	14,45

378	Milówka (2)	10090	63,96
379	Miłkowice (2)	6531	0,32
380	Mińsk Mazowiecki (1)	40334	100,00
381	Mińsk Mazowiecki (2)	14856	7,38
382	Mirzec (2)	8333	11,44
383	Mława (1)	31030	70,20
384	Mogilany (2)	13532	40,51
385	Mogilno (3)	24840	16,37
386	Mońki (3)	15155	60,19
387	Mosina (3)	31088	18,37
388	Moszczenica (2)	11948	16,13
389	Mstów (2)	10759	98,76
390	Mszana (2)	7548	55,60
391	Mszana Dolna (1)	7924	25,92
392	Mszana Dolna (2)	17452	13,04
393	Mykanów (2)	14947	96,64
394	Mysłowice (1)	74851	100,00
395	Myszków (1)	32327	100,00
396	Myślenice (3)	43493	36,07
397	Nakło nad Notecią (3)	32289	41,69
398	Namysłów (3)	25749	62,33
399	Nawojowa (2)	8489	30,86
400	Nędza (2)	7374	79,13
401	Niebylec (2)	10515	12,33
402	Niedźwiedź (2)	7257	5,17
403	Niegowa (2)	5714	98,97
404	Niemodlin (3)	13417	14,30
405	Niepołomice (3)	26633	36,39
406	Nisko (3)	22422	47,00
407	Nowa Brzeźnica (2)	4663	2,42
408	Nowa Dęba (3)	18403	39,35
409	Nowa Ruda (1)	22823	26,17
410	Nowa Sarzyna (3)	21654	16,76
411	Nowe Brzesko (3)	5763	13,03
412	Nowe Ostrowy (2)	3560	2,89
413	Nowe Skalmierzyce (3)	15264	14,11
414	Nowogrodziec (3)	15281	9,59
415	Nowy Duninów (2)	3964	4,67
416	Nowy Dwór Mazowiecki (1)	28362	47,75
417	Nowy Sącz (1)	83903	100,00
418	Nowy Targ (1)	33510	86,68
419	Nowy Targ (2)	23717	21,17
420	Nowy Tomyśl (3)	26207	62,14

421	Nowy Wiśnicz (3)	13759	1,83
422	Nowy Żmigród (2)	9218	8,40
423	Nysa (3)	57710	79,70
424	Oborniki (3)	33830	57,69
425	Oborniki Śląskie (3)	19902	42,39
426	Obrzycko (2)	4467	31,70
427	Ochotnica Dolna (2)	8470	7,96
428	Ogrodzieniec (3)	9223	100,00
429	Olecko (3)	22078	44,14
430	Olesno (3)	17941	52,36
431	Oleśnica (1)	37450	98,83
432	Olkusz (3)	49515	94,86
433	Olsztyn (2)	7736	100,00
434	Opalenica (3)	16303	21,17
435	Opatów (2)	6837	25,86
436	Opoczno (3)	34842	65,43
437	Opole (1)	118931	92,40
438	Ornontowice (2)	5938	64,50
439	Orzesze (1)	20346	96,20
440	Osiek (2)	8179	30,21
441	Osiek (3)	7804	6,30
442	Ostrołęka (1)	52571	70,61
443	Ostrowiec Świętokrzyski (1)	70677	100,00
444	Ostrów Mazowiecka (1)	22772	39,63
445	Ostrów Mazowiecka (2)	12889	55,62
446	Ostrów Wielkopolski (1)	72635	84,32
447	Ostrów Wielkopolski (2)	18999	33,00
448	Ostrzeszów (3)	23910	20,55
449	Oświęcim (1)	39215	62,14
450	Oświęcim (2)	18126	100,00
451	Otmuchów (3)	13803	24,70
452	Otwock (1)	45021	85,80
453	Ozimek (3)	19786	59,59
454	Ozorków (1)	19879	59,41
455	Ozorków (2)	6892	71,71
456	Ożarowice (2)	5704	55,52
457	Ożarów (3)	11031	40,42
458	Ożarów Mazowiecki (3)	23194	47,31
459	Pabianice (1)	66895	88,57
460	Pabianice (2)	6975	71,77
461	Pacanów (2)	7481	22,07
462	Pacyna (2)	3690	12,06
463	Paczków (3)	12945	58,05

464	Pajęczno (3)	11713	57,94
465	Panki (2)	5099	50,13
466	Parczew (3)	14749	30,54
467	Parzęczew (2)	5000	89,20
468	Paszowice (2)	3988	100,00
469	Pawłosiów (2)	8433	100,00
470	Pawłowice (2)	18123	72,27
471	Pawonków (2)	6624	41,52
472	Pątnów (2)	6557	0,08
473	Pcim (2)	10982	13,39
474	Piaseczno (3)	79741	39,93
475	Piaski (2)	8621	36,01
476	Piastów (1)	22927	32,41
477	Piątek (2)	6188	17,94
478	Piątnica (2)	10718	47,88
479	Piekary Śląskie (1)	56374	89,06
480	Piekoszów (2)	16321	35,19
481	Pieńsk (3)	9241	23,92
482	Pietrowice Wielkie (2)	6963	61,91
483	Pilchowice (2)	11554	83,16
484	Pilica (3)	8725	98,59
485	Pińczów (3)	21192	57,08
486	Pionki (1)	18938	98,72
487	Pionki (2)	10065	1,18
488	Piotrków Trybunalski (1)	75183	97,03
489	Piwniczna-Zdrój (3)	10673	10,97
490	Pleszew (3)	30201	21,52
491	Pleśna (2)	11975	18,39
492	Płock (1)	121731	57,17
493	Pniewy (3)	12567	38,88
494	Poczesna (2)	12808	88,69
495	Poddębice (3)	15857	48,22
496	Podegrodzie (2)	12849	39,95
497	Polkowice (3)	27387	62,25
498	Polska Cerekiew (2)	4156	33,08
499	Połaniec (3)	11990	68,54
500	Poraj (2)	10931	62,62
501	Porąbka (2)	15408	100,00
502	Poręba (1)	8675	97,69
503	Poronin (2)	11473	26,96
504	Poznań (1)	542348	5,17
505	Praszka (3)	13721	57,55
506	Proszowice (3)	16363	49,55

507	Prószków (3)	9823	54,06
508	Prudnik (3)	27645	67,40
509	Pruszków (1)	60547	100,00
510	Przasnysz (1)	17258	77,51
511	Przeciszów (2)	6733	42,49
512	Przemyśl (1)	62720	8,33
513	Przemyśl (2)	10417	3,60
514	Przeworsk (1)	15585	58,01
515	Przeworsk (2)	14935	38,33
516	Przystajń (2)	5889	31,75
517	Przywidz (2)	5794	28,08
518	Psary (2)	11877	100,00
519	Pszczyna (3)	51928	96,97
520	Pszów (1)	14186	72,75
521	Pułtusk (3)	24338	64,77
522	Pyskowice (1)	18452	100,00
523	Pysznica (2)	10650	6,54
524	Raba Wyżna (2)	14605	27,20
525	Rabka-Zdrój (3)	17322	53,24
526	Racibórz (1)	55492	100,00
527	Raciechowice (2)	6231	23,62
528	Radlin (1)	17913	100,00
529	Radom (1)	216159	20,82
530	Radomsko (1)	47070	83,32
531	Radziechowy-Wieprz (2)	13088	95,57
532	Radziemice (2)	3439	1,40
533	Radzionków (1)	17002	100,00
534	Rajcza (2)	8988	3,40
535	Raszków (3)	11829	11,47
536	Rawa Mazowiecka (1)	17608	49,59
537	Rawa Mazowiecka (2)	8696	100,00
538	Rawicz (3)	30170	76,81
539	Reda (1)	24029	56,52
540	Reńska Wieś (2)	8249	23,01
541	Rędziny (2)	10054	85,10
542	Rogoźno (3)	18222	28,34
543	Rokiciny (2)	6167	2,56
544	Ropa (2)	5369	7,32
545	Ropczyce (3)	27089	38,02
546	Ruda Śląska (1)	139844	100,00
547	Rudnik (2)	5136	40,99
548	Rudnik nad Sanem (3)	10242	10,54
549	Rudziniec (2)	10652	75,92

550	Rybnik (1)	139595	79,89
551	Rydułtowy (1)	21741	100,00
552	Rydzyna (3)	8849	0,05
553	Ryglice (3)	11708	12,15
554	Rypin (1)	16629	74,42
555	Rypin (2)	7496	61,50
556	Rytwiany (2)	6343	63,25
557	Rzepiennik Strzyżewski (2)	6764	4,76
558	Rzeszów (1)	185896	59,82
559	Rzezawa (2)	11117	15,17
560	Samborzec (2)	8596	63,38
561	Sandomierz (1)	24187	46,98
562	Sanok (1)	38486	84,29
563	Sanok (2)	17810	35,51
564	Secemin (2)	4879	13,55
565	Sędziszów (3)	12681	50,92
566	Sędziszów Małopolski (3)	23502	36,36
567	Sękowa (2)	5001	18,28
568	Sępólno Krajeńskie (3)	16053	37,68
569	Sicienko (2)	9839	15,10
570	Siechnice (3)	19819	9,57
571	Siemianowice Śląskie (1)	68231	94,92
572	Siepraw (2)	8635	19,79
573	Sieradz (1)	42890	83,65
574	Sieradz (2)	10399	26,63
575	Sierakowice (2)	19106	13,65
576	Sierpc (1)	18317	85,01
577	Sierpc (2)	7107	12,64
578	Siewierz (3)	12287	97,79
579	Sitkówka-Nowiny (2)	7708	100,00
580	Skała (3)	10477	100,00
581	Skarbimierz (2)	7928	72,50
582	Skarżysko Kościelne (2)	6193	51,74
583	Skarżysko-Kamienna (1)	46900	88,55
584	Skawina (3)	43184	55,09
585	Skierniewice (1)	48388	82,01
586	Skierniewice (2)	7392	100,00
587	Skoczów (3)	26770	66,44
588	Skrzyszów (2)	14084	1,07
589	Sławków (1)	7105	66,81
590	Słomniki (3)	13638	67,91
591	Słopnice (2)	6541	22,55
592	Słupia (2)	4381	0,05

593	Sobótka (3)	12825	0,04
594	Sochaczew (1)	37102	75,84
595	Sokołów Podlaski (1)	18763	79,75
596	Sokołów Podlaski (2)	6061	16,65
597	Solec Kujawski (3)	16767	51,24
598	Sosnowiec (1)	207381	86,51
599	Sośnicowice (3)	8674	92,39
600	Stalowa Wola (1)	62924	95,99
601	Stanisławów (2)	6677	12,40
602	Stara Biała (2)	11611	44,20
603	Starachowice (1)	50355	72,81
604	Starcza (2)	2820	100,00
605	Stargard (1)	68670	60,34
606	Stary Sącz (3)	23445	61,09
607	Staszów (3)	26193	50,93
608	Stąporków (3)	17567	34,22
609	Stolno (2)	5199	39,68
610	Stronie Śląskie (3)	7623	77,28
611	Strumień (3)	12987	63,92
612	Stryków (3)	12445	30,42
613	Stryszawa (2)	11777	6,91
614	Stryszów (2)	6824	28,80
615	Strzegom (3)	26418	16,78
616	Strzelce (2)	4059	16,24
617	Strzelce Opolskie (3)	31040	63,87
618	Strzelin (3)	22109	55,95
619	Studzienice (2)	3639	4,81
620	Sucha Beskidzka (1)	9432	79,87
621	Suchedniów (3)	10427	60,95
622	Sulejów (3)	16245	23,58
623	Sulików (2)	6112	47,51
624	Sulmierzyce (2)	4466	11,22
625	Sułkowice (3)	14663	63,27
626	Sułoszowa (2)	5836	83,74
627	Supraśl (3)	14520	12,59
628	Suszec (2)	12034	74,99
629	Suwałki (1)	69370	0,79
630	Suwałki (2)	7457	0,12
631	Swarzędz (3)	47947	48,35
632	Syców (3)	16771	25,16
633	Szaflary (2)	10915	72,31
634	Szamotuły (3)	29722	61,28
635	Szczawnica (3)	7402	47,26

636	Szczecin (1)	405657	38,62
637	Szczekociny (3)	7963	46,25
638	Szczerców (2)	8097	33,47
639	Szczucin (3)	13210	12,25
640	Szczyrk (1)	5715	93,56
641	Sztum (3)	18727	55,21
642	Szydłowiec (3)	19025	39,11
643	Szydłów (2)	4788	6,02
644	Ślemień (2)	3524	37,63
645	Ślesin (3)	14028	0,86
646	Śrem (3)	41523	78,76
647	Środa Wielkopolska (3)	31591	70,87
648	Świątniki Górne (3)	9774	47,40
649	Świdnica (1)	58377	44,22
650	Świdnica (2)	17038	6,34
651	Świebodzice (1)	23053	5,10
652	Świecie (3)	34183	21,17
653	Świerklaniec (2)	11846	100,00
654	Świerklany (2)	12228	100,00
655	Święciechowa (2)	7789	1,55
656	Świętochłowice (1)	50970	100,00
657	Świnna (2)	8082	74,09
658	Tarnobrzeg (1)	47816	83,65
659	Tarnowo Podgórne (2)	24694	7,90
660	Tarnowskie Góry (1)	61041	91,47
661	Tarnów (1)	110644	45,28
662	Tarnów (2)	25557	36,71
663	Tarnów Opolski (2)	9592	49,70
664	Terespol (1)	5751	49,56
665	Terespol (2)	6782	0,88
666	Tokarnia (2)	8581	11,08
667	Tomaszów Lubelski (1)	19605	96,40
668	Tomaszów Mazowiecki (1)	63960	100,00
669	Tomaszów Mazowiecki (2)	10845	9,48
670	Tomice (2)	7930	24,33
671	Toszek (3)	9429	69,57
672	Tryńcza (2)	8422	6,35
673	Trzcianka (3)	24389	69,49
674	Trzebinia (3)	34204	100,00
675	Trzebnica (3)	23911	54,49
676	Trzemeszno (3)	14387	30,36
677	Trzyciąż (2)	7085	96,43
678	Tuchów (3)	18155	17,15

679	Tuczępy (2)	3780	24,10
680	Tułowice (2)	5257	23,09
681	Turawa (2)	9777	6,36
682	Turek (1)	27743	45,33
683	Turek (2)	9353	100,00
684	Twardogóra (3)	13009	23,21
685	Tworóg (2)	8146	71,32
686	Tychy (1)	128444	100,00
687	Tymbark (2)	6488	24,34
688	Ujazd (2)	7874	31,52
689	Ujazd (3)	6351	25,04
690	Ustroń (1)	16013	37,95
691	Ustrzyki Dolne (3)	17581	28,93
692	Uście Gorlickie (2)	6805	0,91
693	Wadowice (3)	38118	81,18
694	Wałbrzych (1)	115453	41,15
695	Wałcz (1)	25882	31,84
696	Wąbrzeźno (1)	13887	83,57
697	Wąchock (3)	6947	100,00
698	Wądroże Wielkie (2)	4001	1,35
699	Wejherowo (1)	50215	93,72
700	Wejherowo (2)	24067	11,95
701	Węgierska Górka (2)	15102	85,04
702	Węgrów (1)	12781	22,46
703	Wiązownica (2)	11662	14,12
704	Wieliczka (3)	56704	56,59
705	Wieliszew (2)	12716	63,38
706	Wielka Wieś (2)	11231	12,90
707	Wielopole Skrzyńskie (2)	8308	17,83
708	Wielowieś (2)	5919	25,34
709	Wieluń (3)	32080	77,30
710	Wieprz (2)	12200	31,15
711	Wieruszów (3)	14287	45,75
712	Wierzchosławice (2)	10721	6,27
713	Więcbork (3)	13357	32,36
714	Wilamowice (3)	16951	71,01
715	Wilkowice (2)	13341	93,06
716	Wiśniowa (2)	7746	29,55
717	Witkowo (3)	13750	51,73
718	Włocławek (1)	113041	20,90
719	Włodowice (2)	5244	100,00
720	Włoszczowa (3)	19755	53,74
721	Wodzisław Śląski (1)	48677	100,00

722	Wojkowice (1)	9055	100,00
723	Wola Krzysztoporska (2)	11895	4,65
724	Wolbrom (3)	23231	94,42
725	Wolsztyn (3)	30400	23,96
726	Wołczyn (3)	13839	43.53
727	Wołomin (3)	51709	70,45
728	Wołów (3)	22786	1,45
729	Woźniki (3)	9668	95,87
730	Wręczyca Wielka (2)	17684	86,23
731	Wrocław (1)	635759	33,25
732	Wronki (3)	19076	57,74
733	Września (3)	45952	31,19
734	Wyry (2)	7837	100,00
735	Wyszków (3)	39209	51,00
736	Zabierzów (2)	25565	16,50
737	Zabrze (1)	176327	87,69
738	Zagnańsk (2)	12960	0,05
739	Zagórz (3)	13036	9,06
740	Zakliczyn (3)	12410	10,00
741	Zakopane (1)	27442	100,00
742	Zaleszany (2)	10866	0,53
743	Zambrów (1)	22206	67,18
744	Zator (3)	9326	28,50
745	Zawadzkie (3)	11654	54,13
746	Zawidów (1)	4272	36,82
747	Zawiercie (1)	50642	93,47
748	Ząbki (1)	33818	48,93
749	Zbrosławice (2)	15858	100,00
750	Zduny (3)	7452	1,14
751	Zduńska Wola (1)	42998	61,55
752	Zduńska Wola (2)	12021	100,00
753	Zdzieszowice (3)	16040	91,17
754	Zebrzydowice (2)	13218	87,16
755	Zelów (3)	15068	51,04
756	Zembrzyce (2)	5622	37,73
757	Zgierz (1)	57234	93,55
758	Zgierz (2)	13593	26,26
759	Zielonka (1)	17488	45,20
760	Zielonki (2)	21279	37,40
761	Ziębice (3)	17670	48,89
762	Złotoryja (1)	15951	71,23
763	Złotów (1)	18440	39,01
764	Złotów (2)	9708	100,00

765	Żarki (3)	8422	100,00
766	Żegocina (2)	5405	24,94
767	Żmigród (3)	14808	25,77
768	Żnin (3)	24435	49,96
769	Żory (1)	61945	100,00
770	Żuromin (3)	14646	60,96
771	Żychlin (3)	12283	75,32
772	Żyraków (2)	13847	2,59
773	Żywiec (1)	31815	100,00