

TWO BARRIERS TO CARTOGRAPHICAL PRESENTATION OF 'UNDER-REPRESENTED' GROUPS WITHIN THE GLOBAL POPULATION

Ewa Krzywicka-Blum

Agricultural University of Wrocław, Department of Geodesy and Photogrammetry
ul. Grunwaldzka 53, 50-357 Wrocław, Poland
phone/fax (+48 71) 3205617, e-mail: ekblum@kgf.ar.wroc.pl

ABSTRACT

In the article, the choice and valorisation of the important structural divisions of the society have been presented. The choice of features has been conditioned by their influence on each of the four distinguished groups of problems concerning social imbalance. Finally, the choice of the methods of maps' elaboration, suitable for their usefulness and perceptual quality, has been indicated.

1. INTRODUCTION

The aim of demography is "to study the regularities of population's development in specific economic and social conditions in a given territory" [Holzer, 2003]. As the way of formulating the results of the studies, "the statistically-analytical description of the state and structure and the evaluation of changes and predicted effects of population's migration" are distinguished, while the "contemporarily important role" is attributed to "the studies of separate social groups".

It can be observed that both establishing the aim of the research and the choice of results' presentation are compatible with the assumption concerning the constancy of the spatial background, that is – treating the changes' flow in isolation from the observations of spatial interactions. It is at variance with the aim of the research concerning the processes caused not only by natural migrations of population but also by nomadic migrations.

Similarly to demography, also cartography is the science in which the results of studies are presented by a description. However, it has the form of the picture – graphic code referred, as in the case of statistic maps, to separated sub areas of the observed territory. This quality of statistic maps decides on their usefulness in the contemporary demography which is characterized not only by broadening the studies over states to the studies of processes but also the studies in the particular place to the studies of spatial relationships.

2. THE SUBJECT OF STUDIES

In the spectrum of contemporary attention over social demography, apart from studies over migration, urbanization results, fertility conditions and social mobility of population, also the issues of discrimination of particular sub-populations, not only ethnical or religious minorities, but also the elderly, the disabled people, women and even children, are of great interest. The issues of equality, equal status, sufficient representativeness, determined priority, indices of: identity, integration or segregation of given society, are becoming significant elements shaping the social politics of the countries which declare modernity and care for balanced development. For example, according to the employment code (art. 18^{3a} § 1), the equality of treatment concerns "reaching and terminating the employment, employment's conditions, conditions and availability of professional courses in order to increase the qualifications independently of gender, age, disability, race, religion, ethnic origin, political views, association's belonging, nationality or sexual orientation".

Most of the international organizations have in their assumptions counteracting the discrimination of social groups. When it comes to women's rights, in 1902 the International Tribunal of Justice in Hague announced that all the manifestations of discrimination, also when it comes to gender, are against the law and since the beginning of 20th century, the legal position of women has been the subject of international regulations. That matter concerns also UN in which the Commission of Women's Rights has existed since 1946. The Inter-American Commission of Women's

Rights has existed since 1918. Many conventions directly concern women's rights. As the example, the following can be presented: convention of political rights of women (1952), convention of nationality of married women (1957), convention nr 100 of International Labour Organization concerning the equal pay of women and men for the work of equal quality (1951).

International cartographic Association since 1958, unambiguously in the status and then in the assumptions characterizing each 4 years of activity, declares [ICA, Directory 2003–2007] non-discrimination on the basis of politics, nationality, religion, race and gender.

It concerns not only participating in the works of ICA but also the discipline itself. Unfortunately, the socio-demographic studies have not met the approval of modern cartography, yet. Few atlases which have traditional form, devoted to women, language or religious groups, or the distribution of illnesses, reflect the speed of structural transformations inside the societies in different regions in the world.

The clearer consideration of the socio-economic conditions of the structure – creating processes can be observed in the thematic maps in the national and regional atlases. However, the most socio-demographic issues can be found in the maps published by the press, television and Internet. Those maps are the fast and current method of transmission but, unfortunately, they are not often conceptually complete. It concerns both the content elements' choice and the method of presentation, undermining, in the opinion of the users, the recognition qualities of the whole subject [Pawlak, 2005].

It requires from the cartographers elaborating modern, when it comes to form, and methodologically correct maps' patterns, presenting basic issues of current social demography, characteristic social relationships in the local, regional and global scale.

3. SOCIAL PHENOMENA AND THE CRITERIAL FEATURES OF SOCIAL DIVISIONS

Making the range and methodology of the studies over global socio-demographic processes formal, requires defining basic terms, rules of obtaining, gathering, transferring and availability of data, and finally, choice of diagnostic features describing states.

Despite the fact that most of the countries accepted the standards proposed by UN and other not regional, international organizations, the differences in the choice of demographic and socio-professional features in the census carried out each ten years, are still big. It results from adjusting the scope of national censuses to the conditions of environment and culture of the given society. Even in the frame of political system, only the general assumptions of social politics are unambiguously defined, while the views concerning details often decide on the differentiated practical solutions.

To give an example, during the meeting on "Social inequality" [Kalukin, 2005], attributing the leading role when it comes to counteracting the discrimination and securing the poor for safety and self-respect, to the country in the developed phase of democracy was non-questionable. The differences in opinions appeared when the issue of detailed rights of the citizen was discussed. One of the most outstanding contemporary social philosophers, lord Ralf Dahrendorf, claimed that the full citizenship cannot be discussed without the equal access to the medical help and educational system and country should not remove inequalities but should ensure the equality of chances, and as a matter of fact, not even chances but equality of opportunity by access to the instruments. Another opinion was presented by professor Wiktor Osiatyński (the lawyer) who questioned the importance of applying the public money to the full protection of equal educational chances of all citizens.

"Demographic minimum" for the whole world is made by the set of three features. These are: the gender, age and marital status. Few other features have global character. Different relationships of the features make it possible to carry out the numerical analyses of states and processes inside the societies, using defined characteristics and indices. For the aims of that paper, devoted to the issues of social imbalance, and strictly speaking to under representative groups, the categorisation of chosen features according to their significance in the studies over practical implementation of human rights, was made (Table 1).

Those rights were divided into four groups:
the possibility of ensuring the:

- I. Individual and family existential needs
 - A. Access to the medical help; B. Birthright; C. Ensuring the family existential needs.
- II. Access to education.
- III. Equal access and equal conditions of work
 - A. Access to work; B. Conditions of promotion and senior position; C. Earning.

IV. Social and cultural needs

A. Social and political needs; B. Cultural needs.

Table 1. The categorisation of the features according to the conditions of human rights' protection

No.		Feature	I			II	III			IV		Remarks
			A	B	C		A	B	C	A	B	
1	a b	GENDER	C+	A+ A-		C-/+	C- C+	C- C+	C- C+	C-/+	C-/+	
2	a b c d e	AGE	C+ C+ C+ C+/- C-	A- C-/+ A+ A- A-	C+ C+ C+/- C-/+ C+	C+ A+ C+/- C-/+ C-	C- A+ C- C- C-		C- C- C+ C+ C+	A- C-/+ C+ C+ C-/+	A- C-/+ C+ C+ C+	
3	a b	MARITAL STATUS	C+		C+		C+/- C-/+	C+		C+ C-	C+ C-/+	
4	a b	CITIZENSHIP	A+ C-	(C-)	A+ C-	A+ C-/+	C+ C-/+	C+ C-/+		C+ C-	C+ C-/+	() – only for Chinese
5	a b c d	SOURCE OF INCOME	A+ C+ A+ C+		A+ C+/- C+/- C-	C+ C+ C- C-	C- C-/+ C-/+ C+/-			C+ C+ C+ C-	C- C- C- C-	
6	a b	HEALTH STATUS				C+ C-/+	C+ C-/+	C- C-		C-/+ C-	C- C-	
7	a b	LITERACY				C+ C-/+	C+ C-	A- C-		C- C-	A+ A- C+ C+	
8	a b c	EDUCATION				C+ C+/- C-	C- C+/- C+ C+	C- C-/+ C+ C+		C- C-/+ C+ C+		
9	a b	PROFESSION	C+		C+	C+/- C-/+	C+ C-/+	C+/- C-/+	C+/- C-/+	C+/- C-/+	C+/- C-/+	
10	a b	COUNTRY OF BIRTH				C+/- C-/+				C+ C-	C+/- C-/+	
11	a b	FORMER RESIDENCE				C+ C-				C- C-/+		
12	a b c	PLACE OF RESIDENCE	A+ C+/- A-	(A-)	C+ C- C-	A+ C-/+ C-	C+ C-/+ C-	C+ C- C-	C+ C- C-	C+ C-/+ C-	C+ C-/+ C-	() – for PR of China only
13	a b	NATIONALITY/RACE		(C-/+)		C+ C-/+	C+ C-/+	C+/- C-/+		C+ C-/+	C+ C-/+	() – for Chinese
14	a b	USED LANGUAGE				C+ C-	C+ C-/+	C+ C-		C-/+ C-	C+ C-	
15	a b	WORSHIP									C+ C-	

A – absolute features, C – features of influence, “+” and “-” show direction of influence, C+/- – prevalence of positive than negative influence, C-/+ – prevalence of blocking than supporting influence.

Features 1, 2, 3, 4, 8, 10 and 11 were chosen according to recommendations [Recommendations, 1998] the 12th one according to recommendations of Eurostat, 5th and 9th according to UN Statistic Commission. Features 6, 7, 13, 14 and 15 are the additional ones, considered by the national censuses.

Signatures 1–15 refer to:

1. GENDER, a. women, b. men;
2. AGE, a. kindergarten, b. school, c. age of professional activity (younger, for women – procreation), d. age of professional activity (older), e. post-working age;
3. MARITAL STATUS, a. single, b. married;
4. CITIZENSHIP, a. in the country, in which the census was carried out, b. of other country;
5. MAIN SOURCE OF INCOME, a. employed, b. on the maintenance of the employed, c. pensioners, d. on the maintenance of pensioners;
6. HEALTH STATUS, a. non disabled persons, b. disabled persons;

7. LITERACY, a. literate, b. illiterate;
8. EDUCATION, a. primary, b. secondary, c. higher;
9. PROFESSION, a. with profession, b. without profession;
10. COUNTRY OF BIRTH, a. the one in which census was carried out, b. other;
11. COUNTRY OF RESIDENCE (one year before census) a. the one in which the census was carried out, b. other;
12. PLACE OF RESIDENCE, a. citizens of a given country, registered for permanent residence, b. foreigners (without registration of given country) present in the country, c. absent in the given country, permanent residents, being abroad on business trips, treatment or in prisons;
13. NATIONALITY/RACE, a. of the majority of the country in which the census was carried out, b. other;
14. USED LANGUAGE, a. of the majority of the country in which the census was carried out, b. other;
15. WORSHIP, a. without limitation of women's rights to work, education, social issues and other, b. with limitations

The differentiated number of separations in inner divisions of both features and issues in sections I–IV should be made equal according to the chosen subject analyses. Because of that, the general estimation of influence, including all the features and sections, have been preceded by the sections' aggregate – to the divisions of two-parts features and getting rid of inner subgroups in the sections. The features which in the Table 1 had 3 or more separations were as follows: age, source of income, education and place of residence. In the two-parts division the aggregate of the groups has been made: for features 2 – a, d and e, into the group a – “professional passivity” and b and c into group b – “professional activity”, for the feature 5 the groups a and c have been joined into a new group a, and b and d into the new group b, and for the feature 8, groups b and c have been joined into new group b. The analysis of the similarity of categorizing symbols' distribution would suggest joining the groups b and c when it comes to feature 12. However, separating the group a' would mean choosing, as the criterion, not the title “place of residence” but already accepted (feature 4) “citizenship”. Eventually, the new group a has been made by joining a and b while group c has been marked as b. In the Table 2, the valorisation of the features in the equalized, two-parts division has been presented. The following have been assigned to the categorizing features: A–3, C–2 and C+/- (and C -/+) adequately 1+ and 0,5+ (1 – 0,5+). In the process of aggregate, those signatures have been equalized taking into account the number of components in the features' divisions and in sections. The signatures were assigned the signs to mark the influence of a given feature (strengthening or weakening the process of equaling possibilities of rights' realization). For each feature, the difference between positive evaluations and negative ones has been calculated. The sum of the absolute values of the differences is a measure of given feature's significance for the sections while the evaluation of their influence on all the analysed rights is the sum of the sums. In the Table 2 it makes the last but one column. The evaluation of a direction of a given feature (the last column) makes the value of the coefficient (obtained as the relation of signatures' sum of the positive influence to the sum of the ones of negative influence). For example, for the feature 1 “gender” by dividing the sum of the positive signatures (1.7 + 1.5 + 2.0 + 1.0) by the sum of negative signatures (1.0 + 1.0 + 2.0 + 0.8) we obtain the value of 1.3. The most powerfully directed positive features are: marital status, profession, nation/race, citizenship, age and gender which indicates the privilege of the certain subgroups of people. At the same time the negative features (the values of coefficient from 0.2 to 0.6) confirm the significance of such features as religion, country of residence the year before the census and the health status (disability) in the studies over discrimination. In the ranking of features, according to data in Table 2, in the holistic approach, the following can be distinguished: citizenship, gender, literacy and used language. Respectively – in sections:

- I. (existential conditions): citizenship, gender, country of residence,
- II. (availability of education): country of residence and citizenship,
- III. (labour conditions): gender, education, literacy
- IV. (socio-cultural needs) – literacy, used language, citizenship and marital status.

Table 2. Features' valorisation of the features according to the conditions of human rights' protection

Features		I EXISTENTIAL			II EDUCATIONAL			III LABOUR			IV SOCIO-CULT.			$\Sigma\Sigma$ $\Sigma\Sigma \Delta $	$\frac{\Sigma\Sigma\Delta+}{\Sigma\Sigma\Delta-}$
		+	-	$\Sigma \Delta $	+	-	$\Sigma \Delta $	+	-	$\Sigma \Delta $	+	-	$\Sigma \Delta $		
a. women		1.7			0.5	1			2		0.5	1			
b. men			1		2			2		1.5	0.2				
1. GENDER	Δ	1.7	1	2.7	1.5	1	2.5	2	2	4.0	1	0.8	1.8	11.0	1.3
a. non working age		1.2	1		1.7	0.7			0.2		0.6	1.5			
b. working age		1.2	0.8		0.8	0.8		1.2	0.7		2				
2. AGE	Δ	0	0.2	0.2	0.9	0.1	1.0	1.2	0.5	1.7	1.4	1.5	2.9	5.8	1.5
a. single								1.0	0.2		2				
b. married		1.3						0.2	0.3		0.2	1.5			
3. MARITAL STATUS	Δ	1.3		1.3				0.8	0.1	0.9	1.8	1.5	3.3	5.1	2.4
a. of given country		2			3			1.3			2				
b. other			1.3		0.5	1		0.3	0.7		0.2	1.5			
4. CITIZENSHIP	Δ	2	1.3	3.3	2.5	1	3.5	1.0	0.7	1.7	1.8	1.5	3.3	11.8	1.6
a. work, rent, pension		1.7	0.1		1	1		0.1	0.2		1				
b. on the maintenance		0.8	0.4		1	1		0.2	0.4			1			
5. SOURCE OF INCOME	Δ	0.9	0.3	1.2	0	0	0	0.1	0.2	0.3	1	1	2.0	2.5	1.3
a. non disabled					2			0.7							
b. disabled		1.3	0.7		0.5	1		0.3	1.3			2			
6. HEALTH STATUS	Δ	1.3	0.7	2.0	1.5	1	2.5	0.4	1.3	1.7		2	2.0	8.2	0.6
a. literate					2			0.7			2.5				
b. illiterate					0.5	1			2.3			2.5			
7. LITERACY	Δ				1.5	1	2.5	0.7	2.3	3.0	2.5	2.5	5.0	10.5	0.8
a. primary					2				2			1			
b. secondary or higher					0.5	1.2		1.2	0.2		1.1	0.2			
8. EDUCATION	Δ				1.5	1.2	2.7	1.2	1.8	3.0	1.1	0.8	1.9	7.6	1.0
a. with profession		1.3			1	0.5		1.3	0.3		1	0.5			
b. without profession					0.5	1		0.5	1						
9. PROFESSION	Δ	1.3		1.3	0.5	0.5	1.0	0.8	0.7	1.5	1	0.5	1.5	5.3	2.1
a. of census					1	0.5					1.5	0.2			
b. other					0.5	1					0.2	1.5			
10. COUNTRY OF BIRTH	Δ				0.5	0.5	1.0				1.3	1.3	2.6	3.6	1.0
a. of census					2										
b. other						2					0.2	1.5			
11. PLACE OF RESIDENCE (one year before census)	Δ				2	2	4.0				0.2	1.5	1.7	5.7	0.6
a. in the same country		0.9	0.4		1.8	0.5		1.1	0.8		1.1	0.8			
b. abroad			1.7			2			0.7			2			
12. PLACE OF RESIDENCE	Δ	0.9	1.3	2.2	1.8	1.5	3.3	1.1	0.1	1.2	1.1	1.2	2.3	9.0	1.2
a. of the majority					2			1	0.2		2				
b. other					0.5	1		0.3	0.7		0.5	1.0			
13. NATIONALITY/RACE	Δ				1.5	1	2.5	0.7	0.5	1.2	1.5	1.0	2.5	6.2	1.5
a. of the majority					2			1.3			2				
b. other						2		0.3	1.3			2			
14. USED LANGUAGE	Δ				2	2	4.0	1.0	1.3	2.3	2	2	4.0	10.3	0.9
a. without restrictions											1				
b. with restrictions			0.7			2			0.7			1			
15. WORSHIP	Δ		0.7	0.7		2	2.0		0.7	0.7	1	1	2.0	5.4	0.2

The least because only 8 features have the influence on the analysis of the problems in section I, the most – 15, should be taken into consideration while evaluating the conditions of the socio-political and cultural needs' protection.

In the section I, the most influential features, when it comes to privilege, are job and marital status while religion can be an barrier which would slow the right's equality also in the sections II and III.

The detailed analyses of features' connection, according to the similarity of signatures' distribution, create the conditions for correct modelling. That's why they are the basis for thematic maps' creation presenting social structures.

4. TRADITIONAL AND CURRENT MAPS OF SOCIAL GROUPS

Among the features implicating the social divisions, the traditional maps frequently presented the divisions according to gender, age, language, race and religion. In the global scale, the methods of cartodiagrams, choropleths and signature's range have been created. Rarely – the dot method. In the issues connected with inequality of two parts of society when it comes to rights, the relative scale is of basic importance. For evaluation of the spatial distribution of “force of resistance” on the way to quantitative leveling the minority sub-population. L' with the rest ($L-L'$) of society in an area P the relative shortage can be used. Level of distinction inequality of shares and structural inequality of shares are suitable measure of inequalities of shares of two components [Klimczak, 2001]. In practice, very often instead of separately treated cartographic presentation of each group the choropleth method is used, but the most proper choice to express the share is to scale reference unit according to the level of L and to create an equidemic cartogram. In case of cross-division of population different indices connected with evaluation of unequal level of accessibility to education, socio-cultural public activity or labor market have been determined. Choropleth map is the right kind of model to present relative measure of participation's inequality, but percentage diversification can be shown using cartogram with anamorphically transformed background.

For extremely unequal structure dot's method for minorities groups and interval-choropleth method for majorities groups on the equidemicly organized background can be proposed [Krzywicka-Blum, 2003]. The „value-by-area” method should be broadly applied in case of demographic maps presenting the relation between two compared subpopulation of population living on a given territory, for instance: working age population against level of unemployment [Krzywicka-Blum, 2001b]. The reinstatement to correspondence between the metric of background and of the feature is the base of guarantee of right perceptual properties of the cartographic model.

SUMMARY

In the social studies, the choice of criteria is of great importance. The attempt to categorize the influence of separate features on the analysed issues connected with inequality when it comes to conditions of obeying human rights allowed to divide the features into more and less powerful, strengthening and weakening the processes of equalizing. Correctly constructed maps which show the territorial differentiation of structural divisions, can be an important tool in the studies over socio-demographic processes.

ACKNOWLEDGMENTS

There are several people attending the FORUM'2005 organized by the ICA' Commission on Gender and Cartography as the platform for exchanging new ideas, results of researches and experiments connected with different under-represented groups of people and the role of cartography in presenting variety of their social problems. I owe special thanks to geographers: professors Władysław Pawlak, Jacek Paślawski, Wiesława Żyszkowska, Members of ICA's commissions on Gender and Cartography and on Theoretical Cartography and ethnographers, sociologists as well as representing the Statistical Office participating in the Forum. Without the collective intellectual effort of the specialists I would have neither the knowledge nor the confidence to public this paper.

BIBLIOGRAPHY

1. Atlas języków. Pochodzenie i rozwój języków świata, 1997., red. B. Combie, S. Matthews and M. Polinsky (Atlas of languages, Roots and development of languages in the world).
2. Holzer, J.Z., 2000, Demografia, PWE, Warsaw.
3. ICA, Directory 2003–2007, GIN, Ser. No. 1, p.16.
4. Kalukin, R., 2005, Report of discussion: “Social inequalities: University of Warsaw, Vienna Human Institute”, *Gazeta Wyborcza*, 13.04.2005.
5. Klimczak, H., Krzywicka-Blum, E., 2001, Cartography versus chosen problems of underrepresented groups of people, *Proceed. of the 20 ICC, Beijing*.
6. Krzywicka-Blum, E., 2001a, Cartographic presentation of chosen problems of demographic “underrepresented” groups, *Zeszyty Naukowe, Agricultural University of Wrocław, ser. Geodesy XVIII, No. 416, pp. 53-63*.
7. Krzywicka-Blum, E., 2003, Cartography in the face of socio-cultural transformation of global population, *Proc. of the 21st ICC, Durban, pp. 531-539*.

8. Krzywicka-Blum, E., 2001, Cartographic visualization of two-component quantitative features recognized in sampled form, *Electronic Journal of Polish Agricultural Universities*, 2001, Vol. 4, Is. 2, Series "Geodesy and Cartography" (<http://www.ejpau.media.pl/series/volume4/issue2/geodesy/art-01.html>).
9. Pawlak, W., 2005, True and false of the statistic map.
10. Recommendations for the 2000 Censuses of Population and Housing on the ECR Region, UNCCE and Statistical Office of EC, Geneva, 1998.

Biographical sketch of Prof. Ewa Krzywicka-Blum

Prof. Ewa Krzywicka-Blum is a mathematician and geodesist. She worked in both these special fields, firstly (1954–1960) at the Technical Univ. of Wrocław and next (1960–2001) at the Agricultural Univ. of Wrocław as a research worker, heading of over twenty years the Dept. of Geodesy and Photogrammetry. As a Chair of the ICA commission on “Gender and Cartography” she is special interested in theoretic basis of cartographic modelling of social problems, as well as in applying sound method coding to produce new types of contour maps for the blind.

Address:

Agricultural University of Wrocław
Department of Geodesy and Photogrammetry
ul. Grunwaldzka 53, 50-357 Wrocław, Poland
phone/fax (+48 71) 3205617
e-mail: ekblum@kgf.ar.wroc.pl