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CONSTRUCTING A REGIONAL GENDER EQUALITY INDEX: REFLECTION FROM A FIRST EXPERIENCE WITH NORWEGIAN DATA

Paper submitted by Norway[1]

Introduction

How is gender equality to be measured, and how can the status of women and men in society be compared between different regions of the world? These questions are not easily answered as there is no "correct" definition of the concept of gender equality which is universally agreed upon across countries and societies. Besides, there are no single well-defined tools, such as a limited bundle of indicators or analytical methods to help produce the answers.

Through international statistical collaboration, however, several attempts have been made to develop and agree upon adequate measures and indicators. This process has progressed during later years and has resulted in several statistical publications[2]. To simplify the comparison of the level of gender equality across countries, efforts have been made to compile and combine various indicators in the form of indices. International comparisons by means of indices has a fairly long tradition in other statistical fields such as national economics and welfare research. During later years the UNDP has included gender equality indices in their rankings of its member countries[3].

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[2] The most recent examples: The World's Women. Trends and Statistcs 2000. UN/DESA/UNSD, Women and Men in Europe and North America 2000. UN/ECE (Statistical Division) and Women and Men in the Nordic Countries, Facts and Figures 1999. Nordic Council of Ministers.

[3] The Gender Disparity Index measures the gender disparity in life expectancy, literacy, education and income, and The Gender Empowerment Measure measures gender differences in participation in economic and political life.

It is evident that comparisons of women's status, both in absolute terms and relatively to men, are not easily undertaken in a world of vast cultural, social and economic differences. The smaller the number of indicators used, the more uncertain the conclusions, and the more aggregated measures used, the more difficult to trace the processes behind statistical differences. No surprise therefore, there has been a certain criticism tied to the UNDP gender equality indices. The criticism of course, to some degree reflects national and cultural disagreements concerning the content of the gender equality concept. Accordingly, some may find that the choice of indicators included in the indices is not the conceivably best to reflect the status of women in their society. Among all the problems in this field however, the most significant problem is connected to the missing or restricted existence of relevant comparable data.

Although these problems are generally smaller and far easier to overcome in regional *within* country comparisons than *between* country comparisons, such criticism is to some degree relevant also concerning smaller scale analyses. During later years however, the Nordic Statistical bureaus have experienced an increased demand for various types of synopses or small-scale maps summarising gender equality and the status of women at a regional level. Inspired by some earlier work by Statistics Sweden therefore, Statistics Norway in 1999 did one first attempt to develop a Norwegian regional gender equality index. This paper will discuss some of the considerations made during the index constructing process, indicate some of the problems we met, and present some main results.

Purpose and background.

Gender equality is an approved and established goal in Norwegian politics, both at the governmental and the regional level. So, as municipal elections approached in 1999, Statistics Norway saw an excellent opportunity to disseminate statistics that could contribute to a renewed debate on the role of local politics in promoting gender equality. Thus the process of developing a regional gender equality index was initiated.

As the project had not been included in the 1999 activity plans of Statistics Norway, we had a fairly limited money and time budget at our disposal. Accordingly, the gender equality index presented here has not been evaluated or discussed on a broad methodological/ professional basis. It should be underlined therefore, that the developed index is not to be seen as a Statistics Norway standard measure, but rather as a draft or an experiment for further discussion. This was also emphasised when the results were initially published.

Choice of indicators.

The index is based on data from Statistics Norway's regularly updated regional data base, containing data on aggregate level, i.e. on Norwegian municipalities. Various variable types are included in the data base: demographic data, administrative data and some aggregate activity and welfare data. A total of nine variables, representing all three variable types, were selected to constitute the index.

1. A demographic variable, namely *the number of women per 100 men aged 20-39 years (1998),* was included to reflect, at a very general level, the conditions for women's social and economic participation within the area of residence. This choice was influenced by a concern which has often left it's mark on Norwegian political debate, namely that communities failing to offer suitable employment for women will experience that young adult women move out of the community to find employment. This is assumed to undermine population and economic growth in the area in the long run.

2. Two "administrative" indicators were included in the index, namely the *percentage of pre-school children enrolled in publicly approved day care institutions (1998)* and the *female percentage of municipal council members (1998)*. These two indicators are assumed to reflect certain political aspects of the general "gender equality climate" of the community. Firstly, concerning day care coverage, we assume that a high coverage implies a good gender equality climate. This is due to the fact that the political and administrative responsibility of financing and developing day care institutions is placed on the municipal level. Secondly, we assume that a high coverage would render the best possibilities for mothers of small children to combine child care and paid work. In line with the first assumption, we also assume that a high *female percentage of municipal council members* reflects a generally high political consciousness on gender equality issues, first and foremost among women, but also among men. A high proportion would imply relatively high legitimacy of gender equality policies in the community.

3. Among the more non-controversial indicators of gender equality, at least according to a Nordic gender equality perspective, are: educational level, labour force participation rate and income level. How to measure and how to include them into a gender equality index is however not self-evident. We have chosen to include both the absolute and the relative levels, i.e. women's absolute levels and women's levels relatively to men's. As women's absolute levels, with very few exceptions, range lower than men's on these characteristics, we decided that women's levels should be our main focus. Hence the absolute levels included are the *percentage of women with higher education (1997),* the *percentage of women in the labour force (1998)* and the *mean gross income of women (1997)*. To reflect women's position relatively to men's in the community the following relative measures are included in addition: the *percentage of women with higher education as a ratio of the corresponding percentage of men in the community,* the *percentage of women in the labour force as a ratio of the corresponding percentage of men in the community* and the *mean gross income level of women as a ratio of the corresponding level of men in the community.* As a rule these ratios are lower than 100 percent. The main exception to this rule is however the relative high-education ratio, as the ratio is higher than 100 in quite a few municipalities. This fact implies certain interpretation problems, as high relative scores as a rule are interpreted as an indicator of high gender equality. Hence, as communities where women have much higher education than men, are counted as more (educationally) gender equal than communities where women have equal or lower educational level than men, certain logical problems may be embedded in our model. Consequently the model may be criticised for having a slight "women's bias"[4].

[4] To some degree this is the case also concerning the female/male population ratio, as the ratio score of approximately 8 percent of the communities is higher than 100 (see also paragraph VI.3).

Correlating indicators. Considerations and discussion

1. A fairly modest correlation (corr. 0.24, table 1) between the *female/male population ratio* (indicator 5) and the regional female labour force participation rate (indicator 6) indicates that the anticipated relationship between the two phenomena (see paragraph III.1) is not a simple one. The relatively stronger positive correlation with female educational and female income levels (indicators 3 and 8, corr. resp. 0.49 and 0.44) indicate rather, that a generally high female employment level is not enough for young adult women to chose to stay in their local community. Keeping up an approximately even young adult women to men population ratio at the regional level seems, in addition, to presuppose a certain local occupational structure, including a certain demand for highly educated labour. In a strongly gender segregated labour market like the Norwegian, regional employment of highly educated women is to a large extent conditioned on a local demand for qualified labour in the local public sector, such as teachers, nurses and other qualified care personel.

Table 1

Correlation matrix. Nine indicators and total gender equality index

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1	1.00									
2	0.05	1.00								
3	0.02	0.19	1.00							
4	0.25	0.02	-0.03	1.00						
5	-0.06	0.19	0.49	-0.06	1.00					
6	0.18	0.09	0.41	0.12	0.24	1.00				
7	0.39	0.09	0.29	0.22	0.12	0.68	1.00			
8	0.00	0.25	0.74	-0.13	0.44	0.46	0.42	1.00		
9	0.44	0.15	0.04	0.43	-0.03	0.04	0.50	0.21	1.00	
10	**0.49**	**0.51**	**0.54**	**0.29**	**0.50**	**0.57**	**0.65**	**0.60**	**0.49**	**1.00**

1: Percentage children in public day care, 2: Female percentage in municipal council, 3: Percentage women with high education, 4: Female/male high-education ratio, 5: Female/male population ratio 20-39 years, 6: Percentage women in the labour force, 7: Female/male labour force participation ratio, 8: Average gross income (N.kr) women, 9: Female/male income ratio, 10: Total index

Somewhat surprisingly, there is very low statistical correlation between the female/male population ratio and community child care coverage *or* the percentage women members of the municipal councils (indicators 1 and 2, corr. resp. -0.06 and 0.19). This may indicate that lack of day care institutions for children is no important reason for women to move to another community. Or rather; when lack of child care entails "emigration" from one municipality to another, most often there will be an emigrating couple rather than an emigrating woman. The fairly low correlation between the female/male population ratio and the percentage female municipal council members may be interpreted as an indirect reflection of the moderate influence of local politics on labour market development.

From the discussion above, *and* owing to the fact that occupational data are not available, follows that the indicator *number of women per 100 men aged 20-39 years* constitutes a relevant part of a Norwegian regional gender equality index. There is reason to assume that the female/male population ratio indirectly reflects the various local occupational structures for women and men, and thus serves as a supplement to the labour force participation indicators.

2. According to the assumptions mentioned in paragraph III.2, namely that the two "administrative" indicators, *female percentage of municipal council members* and *day care coverage*, both reflect the level of community engagement in gender equality policies, we would expect to find a positive statistical correlation between the two. Quite surprisingly, we do not (indicators 1 and 2, corr. 0.05). Instead the two indicators seem to reflect different aspects of political gender equality consciousness. To dive deeper into this apparent paradox presupposes however more advanced statistical analyses than the one presented here.

What we do find, is however a high correlation between day care coverage and women's labour force participation rate and women's income level relative to men's in the community (indicators 7 and 9, corr. 0.39 and 0.44). This may indicate that in communities where women have a generally high social and economic position, women's indirect political influence is quite substantial. Another interpretation could of course be the other way around, that women in communities with high day care coverage are able to enter positions equal to those held by men, to a larger degree than do women in communities with low day care coverage. Interesting to see however, is that women's relative economic position seems to count more in relation to day care coverage than in relation to their relative political position. Still, to a certain extent a strong female representation appears to presuppose a certain income level among women (indicators 2 and 8, corr. 0.25).

3. As expected, we find a high overall correlation between the three activity and welfare characteristics; *education*, *labour force participation* and *income level* (six indicators). A large proportion of highly educated women implies for instance high probability of high income among women (indicators 3 and 8, corr. 0.74). The two indicators are also correlated to women's labour force participation rate (indicator 6, resp. corr. 0.41 and 0.46). At the same time we find fairly strong correlation among the relative measures, the high-education ratio (indicator 4) and the labour force ratio (indicator 7) correlating by respectively 0.43 and 0.50 to the income ratio (indicator 9). Somewhat surprisingly however, there is no correlation between the absolute and the relative education indicators (indicators 3 and 4, corr. -0.03). While low education regions are characterised by both sexes being low-educated (i.e. a fairly even distribution of high education among women

and men), the sex distribution of high education seems to be less equal in high education regions. This reflects that highly educated women and men tend to live in the same regions, but at the same time that highly educated men are more heavily clustered into certain regions than women. The same "logic" seems to some extent true for income.

A simple additive index

The index construction was done in a simple additive manner: After having merged the six original education-, labour force- and income indicators into three by adding each absolute and relative scores and dividing by two, the total of nine indicators were reduced to six. The distribution of each of the six indicators was grouped into quartiles. The "best" 25 percent of the municipalities were given the score 4, the 25 percent "second best" the score 3, the "third best" the score 2, and the "worst" 25 percent the score 1. Finally each municipality's scores on the six indicators were summed and divided by the number of indicators included in the index (six). As all indicators were given the same weight (1), the maximum score is 4 and the minimum score is 1. Figure 1 (last page) gives a rough illustration of the gender equality status of all 435 Norwegian municipalities according to the index.

Results

A closer discussion of figure 1 will follow later. First we turn to table 2 to give a short general view of how the nine basic indicators are distributed among Norwegian municipalities.

1. On the average, approximately two out of three pre-school children *attend public (or publicly approved) day care institutions*. The highest proportion of child day care coverage in any municipality (indicator 1) is 98 per cent (in a rural community in Eastern Norway), and the lowest is 34 (in a small south western coastal town). Out of 435 communities these two range respectively as number 213 and 329 measured by the gender equality index. The community ranging at the top of the total gender equality scale has a day care coverage of 81 (another eastern rural community), whereas the communities ranging at the bottom have a coverage of approximately 50 percent (not shown in the table). These facts support the impression given by the correlation coefficient at the bottom line of table 1 (corr. 0.49), that child day care coverage alone is a medium accurate indicator of gender equality at the regional level.

2. With a correlation coefficient of 0.51 (table 1), *the percentage of women in municipal council* (indicator 2) appears to be a somewhat more accurate indicator of regional gender equality. Whereas the country average is 32 percent, the proportion ranges from 57 to 5 percent in the communities (table 2). At the top lies a rural eastern community and at the bottom a sparsely populated Northern community. The number of communities with less than 25 percent are however small, and three out of four communities have a female proportion of 28 percent or more (table 2).

Table 2

The distribution of the nine original gender equality indicators among Norwegian municipalities. Average , minimum, maximum and quartile scores

	1	2	3	4	5	6	7	8	9
1. Quartile	55.7	27.6	12.1	0.91	87.9	73.8	0.85	116134	0.54
2. Quartile	63.6	32.3	14.7	1.03	92.4	76.8	0.88	123375	0.60
3. Quartile	73.0	37.5	17.0	1.17	96.6	79.5	0.90	132183	0.64
Minimum	34.1	4.8	7.3	0.6	71.2	63.6	0.8	100717	0.24
Maximum	97.7	56.6	38.3	2.0	114.4	89.6	1.0	186194	1.04
Average	61.4	32.2	15.2	1.1	91.8	76.7	0.9	125436	0.59

1: Percentage children in public day care, 2: Female percentage in municipal council, 3: Percentage women with high education, 4: Female/male high-education ratio, 5: Female/male population ratio 20-39 years, 6: Percentage women in the labour force, 7: Female/male labour force paticipation ratio, 8: Average gross income (N.kr) women, 9: Female/male income ratio

3. *The female/male population ratio* (indicator 5) appears to have approximately the same predictive value as the two administrative indicators (corr. 0.50, table 1). As shown in table 2, more than half of the communities have a "young adult women's deficit" of seven percent or more. The community with the largest deficit (a ratio of 71) is a tiny western community. At the other end of the scale (with a ratio of 114) is a medium large eastern rural community. Both these communities however range among the best quarter of all communities of the total gender equality scale, respectively number 102 and number 20 (not shown in the table).

4. No surprise, communities where women have the highest *education*, highest *labour force participation rate* and/or highest *income level* generally have a high overall gender equality score. Above all, this applies to communities where women have high labour force participation and income, both in absolute terms and relatively to men (indicators 6,7,8 and 9, corr. resp. 0.57, 0.65, 0.60 and 0.49, table 1). The lower correlation coefficient of the relative as compared to the absolute education indicator (indicators 3 and 4, corr. resp. 0.54 and 0.29, table 1) should be related to the regional sex distribution of education already discussed (paragraph IV.3).

An average of 15 percent of Norwegian women above the age of 16 have an *education above high school level* (table 2). At community level this proportion ranges form 7 to 38 percent, the highest level in a rich neighbouring community to Oslo, the lowest in a small coastal community of the far north. At the same time the community ranging highest on *the women to men education ratio* indicator, is a far northern community; a mainly samic community, with a score of 2 (table 2). This means that the proportion of highly educated women is twice the proportion of men . The high relative score is however more related to a fairly low educational level among men than to a particularly high level among women. We find the lowest relative educational score in a small western community (0.6, table 2), mainly due to low educational level of women. Still the latter community ranges among the mid group on the overall gender equality scale while the former ranges among the top fifth.

5. As shown in table 1, the best single indicator to predict the overall gender equality status within Norwegian municipalities, is women's relative labour market participation (indicator 7, corr. 0.65).

An average of 77 percent of Norwegian women aged 20-66 years are *active in the labour force* against 88 percent of men, the *female proportion* ranging from 64 to 90 percent in absolute terms, and from 80 to 100 percent *relatively to men* (table 2). A sparsely populated tourist community situated in the southern mountains, scores top on both indicators, leaving a small northern fishery community at the bottom of the absolute range, and a varied group of four medium large communities at the bottom of the relative range. The "labour force top community" scores high also on the other index indicators except for *women's percentage of municipal council members*, placing the community among the best five percent of the total gender equality scale. Out of the five lowest scoring communities on the labour force indicators, four range among the lowest quarter of the total scale.

6. The second best indicator to predict gender equality at the regional level, is *women's personal income level* (table 1). No surprise, a rich community neighbouring Oslo scores the highest and a small, sparsely populated rural community scores the lowest on the indicator. Seemingly more surprising is the fact that the score on the *relative income indicator*, i.e. women's personal income relatively to men's, is at it's highest in a sparsely populated rural community of the far North. Actually the community, which is samic dominated, also score top at the relative education indicator (paragraph VI.4). As is the case with the relative educational score of this community, the high relative income score is partly due to the low income level among men. Whereas women 's income level is higher than men's in the region (104 percent of men's, indicator 9, table 2), women's personal income amount to approximately 60 percent on the average for the country as a whole.

7. Figure 1 shows the fairly scattered regional pattern of gender equality in Norway. Within this complex picture however, we somewhat surprisingly find a relatively clear distinction between most southern coastal communities and most communities of the far north, in favour of the north. The main reason to this distinction is that women in the north participate more extensively in municipal politics and in the labour market, the latter leaving women in a fairly equal economic position to men. These observed differences may again be explained by several more general characteristics, such as historical, cultural, industrial and economic conditions, which will not be

further elaborated upon here. The slight general tendency of coastal communities scoring lower on gender equality than several inland communities must be related to a great variety of causes. Women's somewhat marginal part in political and economic life weighs heavily in some instances, while in some instances administrative characteristics, such as low public child care coverage, are of greater importance.

The map also shows that living in a big city is no guarantee of a high level of gender equality. To be sure, Oslo ranges as number 14 among the 435 municipalities and Tromsoe and Trondheim among the best 50. Norway's second largest city, Bergen, however, ranges as number 102 and Kristiansand, our fifth largest city, ranges as number 274.

Conclusion

To conclude, these first experiences from constructing and ranging Norwegian municipalities according to a regional gender equality index, show a wide spectre of interconnections between various local characteristics and gender equality. Although some conditions appear to have a somewhat greater significance than others at the general level, in some cases quite different characteristics prove to be of be of greater importance. As a matter of fact, with very few exceptions, no municipality scores among the highest or among the lowest on all the included indicators.

An additional experience from this first experiment is that, to make a robust and useful gender equality index, a certain variety of indicators should be included. Among the many positive reactions that we received from local "ordinary" people, civil servants and press after the results were released, no surprise there were some negative comments. These (mainly from low score communities) were complaints that people did not recognise the picture of their community drawn by the index. They claimed that the index reflects only part of reality, and that certain indicators are missing. Examples of such indicators are *health conditions, health and elderly care services, housing* and *general well being*. Of course these criticisms are partly right, and there is reason to believe that the index would be a somewhat better tool for measuring gender equality if such indicators were included also. *One* way of improving the gender equality index then, could be to supplement aggregate data with survey data at the individual level, covering also the more subjective elements of gender equality. Such a procedure would however require survey data from samples large enough to allow the splitting up into relevant regional groups. Such a procedure would also require a far larger time and money budget than we have had at our disposal so far.

Figure 1.

Regional Gender Equality Index. Norway 1999