RELIGIOSITY AND SPATIAL DEMOGRAPHIC DIFFERENCES IN THE NETHERLANDS

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ABSTRACT

This paper investigates whether current differences in religiosity between the Dutch regions are also manifested in spatial demographic patterns. We use cluster analysis to distinguish relatively homogeneous clusters of regions, specified by religious affiliation and the frequency of churchgoing among their populations. Although the regional demographic differences are relatively modest in the Netherlands, between-clusters contrasts are consistent with the expected influence of religiosity. The cluster including the most conservative region, the so-called Bible Belt, also displays the most traditional demographic patterns. In order to differentiate the impact of religiosity from the social and economic factors, we perform stepwise regression of selected indicators of fertility, union formation and living arrangements. The frequency of churchgoing rather than the fact of belonging to a certain denomination manifested the strongest impact on the regional demographic contrasts. In case of fertility of parity four and higher, marriage rate and the proportion of young women cohabiting, churchgoing turned out to be the most important predictor of regional differentiation.

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1 INTRODUCTION

Until the 1960s, religion had a prominent position in Dutch society, which was divided into three basic segments: Catholics, Protestants and 'remaining', including an increasing group of people without religious affiliation. Each of these segments provided a comprehensive institutional framework, within which the socialisation and activities of their members took place. Schools, media, political parties, sport clubs, youth organisations and trade unions were different for Catholics, Protestants and the others (initially the socialists). This compartmentalisation of Dutch society has become known as 'pillarization' (*verzuiling*). The greatest internal cohesion was typical for the Catholic pillar (Knippenberg, 1998), while Protestants were further divided into the more liberal members of the Dutch Reformed Church (*Nederlands Hervormde Kerk*) and the fairly conservative followers of the Orthodox-Calvinist Churches (*Gereformeerde kerken*).

The importance of religion in people's lives was manifested by demographic differences between the regions inhabited by Catholics and those inhabited by Protestants. A number of papers have referred to such differences in the level of fertility and in the onset of fertility decline during demographic transition (see e.g. van Heek, 1956, Derksen, 1970, van Poppel, 1983, Engelen and Hillebrand, 1986). Although many other factors, such as urbanisation, social structure, and forms of agricultural production influenced spatial demographic differences, religion had a large impact: "it is astonishing that we can establish that so recently, groups with an identical material livelihood, residing in the same area produce 4 to 5 more children for the sole reason that they belong to a different Christian church" (van Poppel, 1983: 19).

Since the 1960s, rapidly progressing secularisation has led to the increase in non-denominationalism as well as to the decline in the importance of religious teachings on people's lives. In 1960, 18 % of the Dutch people declared they did not belong to any church, while in 1999 they formed a stronger group (41 %) than any of the established churches (Roman Catholics 31 %, Dutch Reformed 14 %, Calvinists 7 %; see Advokaat et al., 2000: 6). With the exception of Orthodox Calvinists, all churches have seen a substantial decline in the church attendance among their members (ibid.: 7). The erosion of the importance of church teachings on demographic behaviour has been indicated by the decline in fertility differences among people with different religious backgrounds;

only Calvinists have continued to stand out as a higher-fertility group (Keij and de Graaf, 2001: 19).

As the churches have systematically engaged in the institutional regulation of individuals' lives, particularly in the domains of family and reproduction (e.g. Lesthaeghe and Surkyn, 1988, Dobbelaere et al., 1999), one might expect that the regional contrasts once connected with the diversity in religion, have not fully diminished due to secularisation. There might be interesting enduring contrasts between the more secularised and the less secularised parts of the Netherlands as well as between regions with different religious tradition. According to Inglehart and Baker (2000: 36), once-powerful Catholic or Protestant institutions still shape the outlooks of everyone living in the countries with Catholic or Protestant tradition.

This paper investigates whether the current differences in religiosity still continue to shape the regional demographic patterns. We distinguish two dimensions of religiosity: religious affiliation and the frequency of church attendance. The latter is an important dimension since people who frequently attend religious services are also more likely to act in accordance with the rules and prescriptions of the church (Dobbelaere et al., 1999).

The paper is structured as follows: Section 2 discusses the influence of religiosity on demographic behaviour and outlines our main hypotheses. Section 3 describes the data, Section 4 discuses the methods of the analysis. Section 5 presents the regional religious differentiation of the Netherlands based on cluster analysis. In section 6 we compare demographic data pertaining to union formation and dissolution, living arrangements and childbearing in various clusters. Section 7 examines results of regression analysis of selected demographic indicators. Section 8 concludes.

2 Religiosity and demographic behaviour

Religious doctrines shape attitudes of people towards a number of issues concerning family life and reproduction, such as birth control, family size, non-marital cohabitation, abortion, adultery and sexual behaviour. A principal component analysis performed by Inglehart (1990: 182) revealed that the 'inviolability of the family and child rearing' was an important part of a single underlying value dimension, capturing the adherence towards traditional Judaeo-Christian cultural norms. However, there are important

contrasts between the teachings of the Roman Catholic Church and Protestant churches as well as within the Protestant communities. The Catholic Church is well known for its fundamentalist position against contraception and abortion, spelled out in an encyclical letter *Evangelium Vitae* (PDR, 1995) and for a pronounced support of traditional family. In the Netherlands, Catholics had been initially in a very strong opposition against neo-Malthusianism and birth control and the Dutch Catholic clergy glorified large families (van Heek 1956: 135). The 'mainstream' Protestants, on the other hand, do not oppose birth control and since they put more emphasis on individual responsibility, they do not propagate so strongly the traditional family values. The Dutch Reformed church had accepted the family planning methods considerably earlier than Catholics (van Poppel, 1983). Though they do not form a unified group, Orthodox Calvinists frequently adhere to conservative and traditional views.

Secularisation, individualisation and related social changes have affected traditional religiosity in two ways. An increasing number of people have declared themselves as non-religious or not affiliated with any of the established churches. However, religion also has lost its strong and encompassing impact on the lives of members of various churches, it has been reduced to become just one out of many subsystems of society (Halman and Pettersson, 1999). Therefore, the impact of religiosity on private behaviour has markedly diminished. Nevertheless, it still "continues to demonstrate a stronger impact on family life, the core of the private sphere, in contrast to matters in the public life" (ibid.: 48). The findings of Procter and Hornsby-Smith (1999: 98) also revealed that religious adherence has a markedly greater influence on sexual morality than on the attitudes towards collectivism and honesty. With the progress of secularisation, a specific group of 'atheists' has emerged; they dislike traditional family values, support the right to abortion, are frequently left-wing and post-materialist: "a rejection of religion goes hand in hand with clear ethical, social and political values that combine left-wing humanism, cultural liberalism, anti-authoritarianism and participatory will" (Bréchon, 1999: 123).

To provide clear hypotheses concerning expected regional differences, we first make a distinction between the *traditional*, *modern* and *'post-modern'*[1] demographic

[1] We use the term 'traditional' to denote demographic patterns prevailing in Western Europe before the (first) demographic transition, i.e. until the mid-19t^{h} century. We use the term 'modern'

behaviour. Table 1 discriminates between the contrasting demographic patterns, elaborating on the distinction between the first and the second demographic transition made by Lesthaeghe and Neels (2001: Table 1).

Outlined differentiation enables us to formulate some hypotheses on the plausible association between the indicators of religiosity and demographic variables.

1. Religiosity is conductive to the more *traditional* demographic behaviour. Since especially the *post-modern* patterns are truly non-traditional, religiosity is also more conductive for the *modern* than for the *post-modern* demographic patterns. Thus, we expect that religiosity influences especially behaviour that has undergone more recent changes and behaviour, for which the *post-modern* trends contrast both with the *traditional* and *modern* characteristics, such as the acceptance of cohabitation. On the other hand, we do not expect religiosity to influence behaviour, whose *post-modern* features contrast with the *modern* ones, but appear fairly close to the *traditional* features, such as the timing of marriage and childbearing.
2. The influence of religiosity differs with the degree of emphasis put on traditional family values (strong among Roman Catholics and Calvinists) and with the strictness of religious observance (strong among Calvinists). It is further supported by a high frequency of church attendance (typical of Calvinists). On the whole, Calvinists are expected to be most strongly associated with the traditional demographic patterns, while the affiliation to the Dutch Reformed Church is likely to have the least impact.
3. High proportion of people without religious denomination is likely to be associated with the *post-modern* demographic patterns.

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as a label for demographic patterns that were characteristic for the 'Golden age of Family' in Western Europe after the Second World War, particularly in the 1950s and the 1960s. The term 'post-modern' denotes the relatively recent demographic changes, often labeled as a 'Second demographic transition'. Such a concept of post-modernism, encompassing the post-materialist dimension, has been discussed by van de Kaa (2001).

Table 1: Traditional, modern and 'post-modern' demographic patterns

Traditional	Modern	Postmodern
Fertility		
Relatively late timing	Relatively early timing	Late timing
Most women have 3 or more children	Births at parity 3+ less frequent, but common	Fewer births at parity 3, parities 4+ rare
Non-marital births exceptional	Non-marital births exceptional	Many extra-marital births, especially in cohabitation
Moderate childlessness	Low childlessness	Moderate or high childlessness
Union formation, union dissolution and living arrangements		
Moderate or high marriage rates	High mariage rates	Low marriage rates
Most people living in 'traditional' family	Most people living in 'traditional' family	Fewer people living in 'traditional' family
		Unconventional living arrangements (e.g. unions of homosexuals) more frequent
Cohabitation exceptional	Cohabitation uncommon	Cohabitation common
Single living exceptional	Few people living single	Many people living single
Few one-parent families	Few one-parent families	More one-parent families
Divorce and separation exceptional	Low divorce rates	High divorce rates
Relatively late marriage	Relatively early marriage	Marriage at a high age, often after the childbirth
Direct marriage out of parental home established norm	Direct marriage out of parental home common	Almost no-one marries directly out of parental home
Standard ordering of the life course	Standard ordering of the life course	Destandardization of the life course

3 Data and selection of variables

Regional data on religiosity, demographic indicators as well as socio-economic variables used in the regression analysis were collected from the Internet database of the Statistics Netherlands (CBS STATLINE, 2002). Indicators of religiosity are from the 1999 Permanent Survey of Life Situation among the adult population (POLS – *Permanent Onderzoek Leefsituatie*), based on the responses of 38 600 persons[2]. The variables specifying religiosity are the percentage of people belonging to the Orthodox Calvinists churches, Dutch Reformed Church, Roman Catholic Church, to other denominations (mostly Muslim population), the share of people with no religious affiliation and the percentage of people attending church at least two times per month. All variables were expressed in the same units of measurement (percentage), therefore a standardisation of variables was not necessary.

To investigate demographic contrasts in distinctive regions specified by religious indicators, we selected demographic data pertaining to fertility patterns, union formation, union dissolution and living arrangements in 1999-2000. These data come from the evidence of vital events derived from the municipal population registers, which cover the whole population of the Netherlands. Selected indicators are presented in the form of time series, focusing mostly on the period of the 1990s. Almost all data are related to women only; fertility rates are traditionally focused on childbearing among women and, for more simplicity, we decided to analyse other variables only for women as well. While commenting on regional demographic differences, we assume that they apply equally for men. This is a plausible assumption since, for instance, in the regions where (heterosexual) cohabitation is more common for women, it should be also more common for men.

[2] The POLS survey is the only detailed source of information on religiosity in the Netherlands after the last Census, held in 1971. As the census-taking subsequently became a widely discussed and sensitive issue, considered by some people as an infringement into their privacy, the system of continuous population accounting has been established to replace it (Latten and Veenstra, 1993). However, the information on religious affiliation is considered to be strictly personal and is not included in population registers, which otherwise provide all the standard data on vital statistics, demographic and social structure of Dutch population.

For the regression analysis we selected 18 explanatory variables specified in Table 2. Primary sources of these indicators are also provided in the table. Indicators of religiosity do not include the proportion of Dutch Reformed, due to the high correlation with the proportion of Calvinists (0.71). Selected socio-economic indicators represent variables that are likely to interact in various ways with the demographic behaviour of the population. Since we are primarily interested whether religiosity appears as a significant

Table 2: Independent variables selected for regression analysis

Indicator	**Source**
Religiosity (1999)	POLS
Calvinists (%)	POLS
Roman Catholics (%)	POLS
Other Churches (%)	POLS
Churchgoing 2+ times per month (%)	POLS
Population structure (2000)	
First + second generation of foreign-born women aged 15-29 (%)	POPREG
Education (2000)	
Basic education only, % population aged 15-64	EBB
Post-secondary education (Hbo + Wo), % population aged 15-64	EBB
Emloyment indicators	
Agriculture, % of economically active population (2000)	EBB
Industry, % of economically active population (2000)	EBB
Unemployment rate, % of economically active population (1997-1999)	official registration
Netto labour force participation of women, % (1999-2000)	EBB
Proportion of economically active women working part-time (1996-2000)	EBB
Income (1998)	
Average disposable income per full-time working person (in Euros)	IPO
Urbanization (2000)	
Average urbanization category on the 1 (very strongly urbanized) to 5 (not urbanized) scale	official classification
Migration (1999)	
Internal migration saldo, women aged 20-24 (per thousand)	POPREG
Internal migration saldo, women aged 25-29 (per thousand)	POPREG
International migration, saldo per thousand inhabitants in 1994-1999	POPREG
Housing (1998)	
% appartments in rental housing sector	database of VROM

Notes:

POLS	*Permanent Onderzoek Leefsituatie* (Permanent Survey of Life Situation)
POPREG	Data collected from the municipal population database
EBB	*Enquête Beroepsbevolking* (Labour Force Survey)
IPO	*Inkomenspanelonderzoek* (The Incomes Panel Survey)
VROM	*Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer* (Department of Housing, Regional Development and the Environment)

predictor of spatial demographic differentiation, we do not formulate specific hypothesis on the impact of particular socio-economic variables. Similarly, we do not address the issue of causality, which may run in the opposite direction than suggested by the model in case of some variables (e.g. high fertility rate of women may subsequently affect their labour participation). When we could choose between similar variables, we tried to opt for the variable with the strongest expected influence on demographic behaviour. Thus we focused on the younger group (15-29) of foreign-born women, which has much larger impact on demographic indicators of our interest than older women, and we distinguished between the internal migration of women aged 20-24 (migration often related to higher education) and that of women aged 25-29 (usually related to family-building). When available, we employed some indicators specified for women only, especially in case we expected a gender-specific impact of certain event (e.g. migration) or status (e.g. part-time employment) on demographic behaviour. The share of rental-housing apartments, most of which belong to the subsidised social housing, serves as an indirect measure of the proportion of population with low income.

4 Methods

Our analysis focuses on the 'COROP' regions, which serve for the purpose of spatial and regional-economic planning, and for which a large amount of statistics is readily available. These 40 regions were defined on the basis of commuting patterns between home and workplace in the 1970s[3] (Eichperger and Filius, 1998).

First we apply cluster analysis to obtain relatively homogenous clusters of regions with respect to religiosity. We choose hierarchical clustering methods, as they do not require a priori knowledge of the number of clusters or the starting partition, which is a definite advantage over nonhierarchical methods. The hierarchical clustering algorithm forms clusters in a hierarchical fashion, that is, the number of clusters at each stage is reduced by one. The first step – the formation of the first cluster – is the same for all

[3] The heterogeneity of many COROP regions, consisting of a strongly urbanized central place and rural surroundings, constitutes a disadvantage of using them as units of analysis. Opting for smaller and more homogeneous units, such as municipalities (almost 500) or 129 EGG (Economic-geographic areas) would leave us with a much smaller amount of data and, due to the insufficient sample size, also with much less reliable measures of religiosity.

methods, however, after the first step the various methods differ with respect to the procedure used to compute the distances between clusters. In the single-linkage method (or the nearest-neighbor method), the distance between two clusters is represented by the minimum of the distance between all possible pairs of subjects in the two clusters. The complete-linkage method is the exact opposite of the nearest-neighbor method. The distance between two clusters is defined as the maximum of the distances between all possible pairs of observations. In the average-linkage method (centroid method), the distance between two clusters is obtained by taking the average distance between all pairs of subjects in the two clusters. The Ward's method does not compute distances between clusters. Rather, it forms clusters by maximizing within-clusters homogeneity. In other words, the Ward's method tries to minimize the total within-group or within-cluster sums of squares. Comprehensive summaries of the various clustering algorithms and the empirical studies comparing these algorithms were provided by Girish and Stewart (1983); the clustering methods are further discussed in detail by Sharma (1996).

All clustering algorithms require some type of measure to assess the similarity of a pair of observations or clusters. Distance measures of similarity are based on the concept of a metric; the most widely used measure of similarity is the Euclidean distance. Since the data in our paper are metric data, the squared Euclidean is chosen as a method for clustering data. The particular above-mentioned clustering methods provided considerably different results. Girish and Stewart (1983) recommended the complete-linkage method and the Ward's method as the most suitable to identify compact clusters. As the Ward's method produced more compact clusters, we decided to apply it to define the clusters in our study. In order to evaluate demographic differences between clusters, we applied one-way ANOVA analysis. F-test was performed to examine the significance of demographic contrasts between clusters. One of the main assumptions of ANOVA analysis is homogeneity of variance, which was investigated using Levene statistics.

Besides the cluster analysis, we perform multiple regression analysis, using to determine whether regional demographic patterns are significantly influenced by the factors of religiosity. Since we included many explanatory variables, which are related to each other, multicollinearity poses a considerable problem: it is difficult to estimate separate effects of two or more closely related variables via regression analysis. In this case, stepwise regression, selecting step by step additional variables and removing those which do not the meet the entry criterion, provides the best solution. By selecting only

the most influential variables, it enables to reduce considerably the large number of possible explanatory variables. For selecting or dropping the explanatory variables, we used usual criteria of the significance values: the variable is entered into the model if the significance value is smaller than 0.05, whereas, if the value exceeds 0.10, the variable is dropped from the model. This approach allows examining the contribution of each independent variable to the regression model.

We present both non-standardised and standardised regression coefficients to indicate which variables have the strongest impact in the regression model. We checked the multicollinearity, using tolerance and variance inflation factor (VIF) statistics and checked the probability plot of standardised residuals, which were normally distributed.

5 Religious differentiation of the Netherlands

We chose the five cluster solution, which yielded a reasonable number of relatively homogenous clusters. The resulting religious division of the Netherlands is presented in Figure 1. Table 3 gives an overview of differences between the clusters with respect to the variables used in the analysis.

The first and the smallest cluster comprises five regions in the north-eastern part of the Netherlands and the province of Flevoland. Although it has a high proportion of Calvinists (14 %) and it is traditionally a Protestant area, it is also characterised by a particularly strong secularisation. People with no religious affiliation form a majority of 57 %. The second cluster, spreading from the north to the south-west contains most of the strongly religious municipalities of the so-called 'Bible Belt', as well as the agglomeration of Utrecht and north-western part of Friesland. Although at the level of the COROP regions the influence of strongly religious communities is moderated by the surrounding less traditional regions, this cluster still displays a high proportion of Protestant population (37 %, including 12 % of Calvinists) and a particularly high proportion of people attending church regularly (24 %). The third cluster contains regions in the east, including the agglomeration of Arnhem and Nijmegen, two regions around the towns of Leiden and Delft in the west and the Zeeuwsch Flanders in the south-west. This is a religiously mixed region with a higher proportion of Catholics (36 %). The fourth cluster, located in the west, is the largest one, consisting of nine regions with 4.5 million inhabitants. It encompasses three out of the four major Dutch cities – Amsterdam,

The Hague and Rotterdam – as well as some smaller agglomerations in the Randstad. It has many features typical of urbanised and culturally diverse regions, such as strong secularisation, low frequency of church attendance and large population belonging to non-Christian, particularly Muslim, religion. The fifth cluster in the southern part of the country is associated with Catholicism: over 70 % of people there are Roman Catholics, while only 6 % belong to Protestant churches. Only a minority of population is not affiliated with any church (one fifth), however, the proportion of regular churchgoers (16 %) is relatively small as well. Thus, the identification with Roman Catholicism is mostly formal.

Figure 1: Clusters of distinctive regions with respect to religiosity in the Netherlands

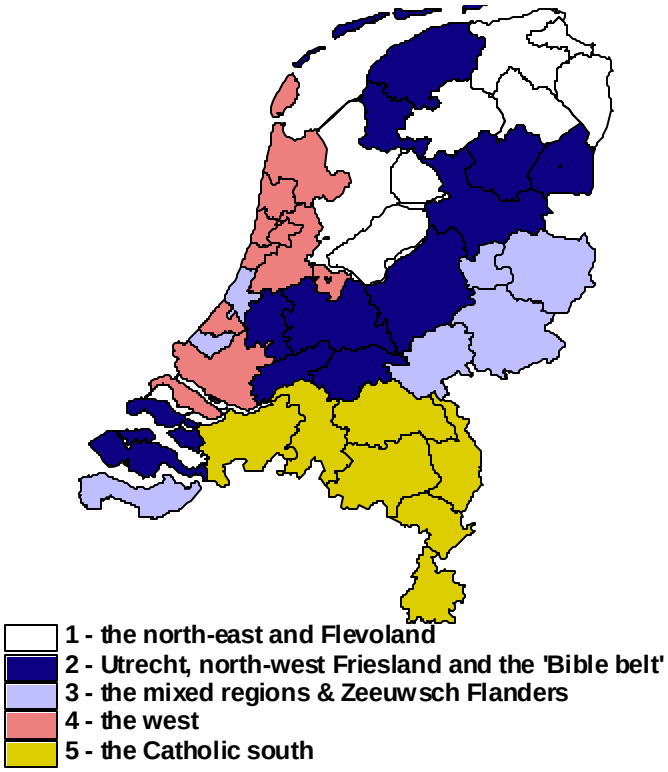


Table 3: An overview of religious indicators in the five analysed clusters

	C1	C2	C3	C4	C5	The Netherlands
Population size, 1999 (thousand)	1241	3994	2508	4541	3477	15760
Religiosity, 1999						
Protestants (%)	28.6	**36.7**	21.0	15.2	5.6	21
Of which:						
- Dutch Reformed (%)	14.7	**24.3**	15.7	10.7	3.9	7
- Calvinists (%)	**13.8**	**12.5**	5.3	4.5	1.7	14
Roman Catholics (%)	8.0	14.8	36.3	18.9	**70.7**	31
Other religion (%)	6.8	8.1	5.6	**12.3**	4.1	8
No affiliation (%)	**56.9**	40.7	37.3	**54.5**	20.0	41
Churchgoing, at least 2+ per month (%)	18.0	**24.4**	16.8	13.9	16.3	18

Note: High values of a given variable are indicated in bold

6 Spatial demographic contrasts

Generally, demographic spatial differences confirm our expectations on the division between the more *traditional* patterns on one side and *post-modern* patterns on the other side, as specified in Section 2. Nevertheless, most variables depict only a modest spatial differentiation; particularly the birth rates are not differentiated between various clusters. Table 4 provides a summary of selected indicators of fertility, union formation and dissolution and living arrangements among young women around the year 2000. The analysis-of-variance F test showed that the clusters are significantly different with respect to all demographic variables at the 0.10 significance level. However, the validity of F test is violated for 4 variables, for which Levene test indicated that the variance is not homogeneous, using again the 0.10 significance threshold (in this case, the null hypothesis assumes constant variance).

With respect to childbearing rates, only the second cluster containing the 'Bible Belt' region differs considerably from other regions. In accordance with its higher degree of religiosity and traditionalism, it displays higher fertility rates, including that at higher parities, indicating that large families are more common there than in other parts of the country. Other indicators reveal that this region has the most traditional demographic patterns in the Netherlands, characterised by the lowest proportion of extra-marital births, highest marriage rates, lowest divorce rates, low prevalence of cohabitation and low proportion of single mothers. Secularisation really seems to go hand in hand with the

Table 4: Spatial differentiation of selected indicators of fertility, union formation, union dissolution and living arrangements in the five analysed clusters, 1999 or 2000

	C1	C2	C3	C4	C5	NL	F-test 3)	Homog. 4)
Total fertility rate (2000)	1.77	**1.86**	1.72	1.66	1.68	1.72	0.002	0.376
Total fertility rate of parity 4+ (1999)	0.08	**0.12**	0.07	0.08	0.06	0.08	0.001	0.001
% nonmarital births (2000)	27.9	20.0	22.9	**32.3**	21.7	24.9	0.000	0.346
Marriage rate per 1000 women (2000) 1)	27.6	**30.7**	27.5	23.4	29.3	27.5	0.011	0.343
Divorce rate per 1000 women (2000) 1)	9.2	8.2	8.5	**11.7**	9.1	9.5	0.000	0.188
% women living single at age 25-29	17.7	17.1	18.4	**24.0**	14.7	18.8	0.052	0.207
% women cohabiting at age 25-29	**32.6**	27.9	31.7	29.9	31.3	30.2	0.097	0.004
% F cohabiting and having children at age 25-29 2)	**22.5**	14.5	18.6	21.4	16.2	18.1	0.000	0.070
% women married at age 25-29	38.4	**42.5**	36.9	31.0	39.9	37.4	0.001	0.239
% women living alone with children at age 30-34	5.9	4.3	4.6	**9.0**	4.9	5.9	0.000	0.000

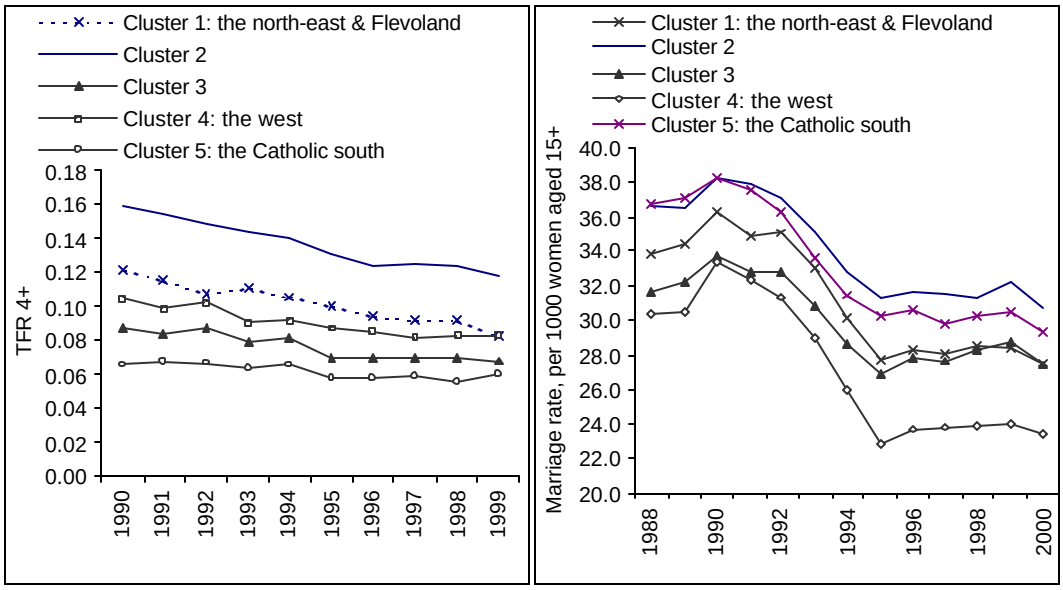
Notes: High values of are indicated in bold, low values are indicated by a grey field

1) indirectly standardised for the age composition of population
2) out of all women living in union and having children
3) F test of significance of between-clusters differences
4) Levene test of significance of homogeneity of variances

post-modern demographic patterns: the most secularised regions (the north-east and the west) have the highest incidence of births outside marriage, the western region further displays lowest marriage rates and highest divorce rates in the country. Low fertility rate at higher parities in the Catholic south may appear as a surprising finding. It clearly indicates that once powerful Catholic ideology favouring large families does not affect the behaviour of people any more. Apparently, southern regions are not characterised by the more *traditional* demographic patterns as was the case in the past. There are, however, several characteristics, which resemble some demographic features typical of the Catholic countries Southern Europe, namely a less frequent occurrence of single living among young people, later home leaving and later timing of first births (not shown here).

To illustrate a relative stability of regional demographic differences, we selected the time series of two indicators – fertility rates of parity 4+ and marriage rates, which are depicted in Figure 2. Similarly to most other spatial demographic contrasts, such as divorce rates, extra- marital fertility, spread of cohabitation and higher incidence of early childbearing, regional contrasts in these indicators are enduring and fairly stable. Some differences have been levelling-off over time; for instance fairly high marriage rates in the Catholic south around 1990, suggesting a stronger attachment to traditional family there, have been approaching the average levels over time. On the other hand, one region,

Figure 2a: Regional differences in the total fertility rate of parity 4+, 1990-1999
Figure 2b: Regional differences in marriage rates, 1988-2000



the north-east, has manifested the move toward the *post-modern* pattern faster than other regions did; it has seen a steep increase in non-marital childbearing over the 1990s (not shown here) accompanied by a reduction in marriage rates.

7 Does religiosity influence spatial demographic contrasts? Regression analysis of selected demographic indicators

Although the spatial demographic contrasts generally supported our hypotheses on the influence of religiosity on regional demographic patterns, they are not strong enough to provide convincing evidence on the enduring influence of religiosity. Some COROP regions consist of too diverse municipalities, with a mix of different population groups making the macro-level relationships between religiosity and demographic behaviour more blurred. Besides that, other factors than religiosity affect the regional demographic patterns. Thus, a cluster analysis of basic demographic indicators on the COROP level provides substantially different result than the cluster analysis of religiosity indicators

shown in Figure 1. This section thus aims to assess whether the influence of religiosity remains significant when non-religiosity variables are included in the analysis. In other words, can religiosity serve as a predictor of regional demographic contrasts? And which indicators of religiosity are important?

We selected seven demographic variables pertaining to fertility, marriage, divorce and living arrangements of young women, which we expected to be most likely influenced by religiosity. These were the dependent variables of our regression analysis, independent variables are listed in Table 2 (Section 3). The main results of the regression – values of R-square, regression coefficients of the significant independent variables and the standardised Beta coefficients – are summarised in Table 5.

The most surprising finding of the regression analysis is a strong influence of institutional religiosity, namely of regular churchgoing, on all selected variables except of the proportion of single mothers. In three cases – fertility at birth order 4 and higher, extra-marital childbearing and the prevalence of cohabitation among women aged 25-29 – churchgoing turned out to be the most important predictor of regional differentiation. The signs of regression coefficient fully conform to the hypothesis that religiosity is conductive for the more *traditional* patterns of behaviour and constitutes a break slowing-down the spread of the *post-modern* demographic characteristics. Thus, regular churchgoing is positively associated with fertility at high parities, marriage rate and with the proportion of women married at age 25-29 and negatively associated with non-marital childbearing, proportion of young women cohabiting and with divorce rates. It is apparent that the 'familism', that is attachment to the more *traditional* family norms among religious people strongly influences spatial differentiation of demographic indicators related to fertility and family behaviour.

Belonging to particular church denominations does not, on the first look, influence regional demographic differences. This is an interesting finding, since at least till the 1950s regional contrasts, especially in case of fertility, were strongly associated with denominational composition of population. Currently the main divisions seem to run between people defining themselves as non-religious and people belonging to the church but not attending the services regularly on one hand and the people who regularly attend religious ceremonies on the other hand.

Out of all considered denominations, only the proportion of Calvinists appeared as a significant indicator in one model. Quite unexpectedly, the proportion of Calvinists

Table 5: Regression models of selected demographic variables based on the data for 40 COROP regions in 1998-2000 (stepwise regression)

Dependent variable	**TFR4+**		
R square	0.606		
Independent variables	**B * 1000**	**Stand. Beta**	**Sign.**
Churchgoing 2+ times per month (%)	4.619	0.793	0.000
Avg. income per full-time working person (EUR)	0.016	0.359	0.002
Dependent variable	**% nonmarital births**		
R square	0.779		
Independent variables	**B**	**Stand. Beta**	**Sign.**
Churchgoing 2+ times per month (%)	-0.685	-0.709	0.000
% appartments in rental housing	0.412	0.559	0.000
Calvinists (%)	0.344	0.380	0.001
Dependent variable	**% single mothers at age 30-34**		
R square	0.823		
Independent variables	**B**	**Stand. Beta**	**Sign.**
% appartments in rental housing	0.108	0.445	0.000
1+2 gen. foreign-born F 15-29 (%)	0.093	0.332	0.007
International migration, saldo per 1000	0.352	0.245	0.014
Dependent variable	**Marriage rate, per 1000 women**		
R square	0.874		
Independent variables	**B**	**Stand. Beta**	**Sign.**
Internal migration saldo, F 25-29	0.119	0.432	0.000
Churchgoing 2+ times per month (%)	0.277	0.367	0.000
% appartments in rental housing	-0.191	-0.332	0.001
International migration, saldo per 1000	-0.947	-0.279	0.002
Post-secondary educ., % pop. 15-64	-0.133	-0.183	0.039
Basic education only, % pop. 15-64	0.276	0.162	0.047
Dependent variable	**% married at age 25-29**		
R square	0.810		
Independent variables	**B**	**Stand. Beta**	**Sign.**
Post-secondary educ., % pop. 15-64	-0.761	-0.642	0.000
Churchgoing 2+ times per month (%)	0.520	0.420	0.000
% appartments in rental housing	-0.314	-0.333	0.000
Avg. income per full-time working person (EUR)	0.002	0.264	0.014
Dependent variable	**% F cohabiting at age 25-29**		
R square	0.678		
Independent variables	**B**	**Stand. Beta**	**Sign.**
Churchgoing 2+ times per month (%)	-0.457	-0.767	0.000
Avg. income per full-time working person (EUR)	-0.002	-0.453	0.001
Basic education only, % pop. 15-64	-0.495	-0.368	0.002
1+2 gen. foreign-born F 15-29 (%)	-0.115	-0.220	0.068
Dependent variable	**Divorce rate, per 1000 women**		
R square	0.746		
Independent variables	**B**	**Stand. Beta**	**Sign.**
% appartments in rental housing	0.082	0.371	0.002
International migration, saldo per 1000	0.467	0.358	0.002
Churchgoing 2+ times per month (%)	-0.088	-0.305	0.002
Avg. income per full-time working person (EUR)	0.006	0.258	0.007

manifests positive association with non-marital childbearing. Such interpretation may be strongly misleading. To illustrate this point, Table 6 shows correlation between various denominations and churchgoing at the level of the COROP regions. It is apparent that frequent churchgoing is strongly associated with both major streams of Protestant religion. Thus, captured via the frequent churchgoing, the influence of religiosity on regional demographic patterns is stronger for the members of Dutch Reformed and Calvinist churches. If we drop the variable of the frequent churchgoing out of the regression analysis, the regression coefficients of Protestant denomination would be the closest substitute of it. If we, however, keep the frequency of churchgoing as well as denomination indicators, the denomination – if significant – shows the opposite relationship than expected. This may be partly a multicollinearity effect, but it may also indicate that in the regions where the proportion of people belonging to Calvinist church or other denominations considerably exceeds the proportion of frequent churchgoers, the influence of this 'non-churchgoing' but still 'religious' group is the opposite of the influence of the 'religious churchgoers'.

While, quite logically, there is an almost perfect positive correlation between the proportion of people who do not belong to any religion and the proportion of people who never go to church, the correlation coefficients of churchgoing with Roman Catholicism are interesting. Roman Catholicism is not correlated with frequent churchgoing and is negatively correlated with 'non-churchgoing'. This finding supports the notion that Roman Catholicism serves more as a label for cultural identity rather than as a manifestation of religiosity. Most Roman Catholics are not strong believers and are fairly secularised, therefore they are not regular churchgoers, however, they keep attending

Table 6: Correlation coefficients of denominationalism with the frequency of churchgoing in the 40 COROP regions in 1999 (Pearson's correlation coefficient)

	Church attendance	
Denomination	2+ times per month	Never or seldom
Protestant (total)	0.718 ***	n.s.
Calvinist (*Gereformeerd*)	0.669 ***	n.s.
Dutch Reformed (*Hervormed*)	0.664 ***	n.s.
Roman Catholic	n.s.	-0.628 ***
Other Churches	n.s.	0.449**
No affiliation	-0.533 ***	0.910***

Significance levels: *** < 0.001, ** < 0.01, n.s. correlation is not significant

church during the major Christian feasts and continue declaring themselves as Roman Catholics.

8 CONCLUSION

For a number of reasons, such as the lack of data, the strong influence of the rational-actor behavioural models and general decline in spatial differences, the role of cultural factors in shaping the demographic differences between countries and regions is frequently neglected. Due to the pronounced regional contrasts in secularisation, religious affiliation and the frequency of churchgoing, the Netherlands is a country well suitable for exploring the relationship between religiosity and spatial demographic patterns. This paper has shown that religiosity remains an important factor of the spatial differentiation of fertility, family formation and dissolution and living arrangements in the Netherlands. While the influence of religion has been eroded by the longstanding secularisation and related cultural changes, people who are religious still frequently display more *traditional* demographic behaviour than people not belonging to any religion. This applies especially for a minority (18 %) of people who regularly attend church: these are the people who are most likely to regulate, at least to a certain extent, their behaviour in order to conform to the morality and teachings of their churches.

To identify the influence of religiosity, we have contrasted the *post-modern* demographic behaviour with the *traditional* and *modern* behaviour, which we labelled simply as *traditional.* Our focus on the *non-traditional*, that is *post-modern*, behaviour stemmed from the fact that its main features, such as unstable families, spread of cohabitation, growth of single living, non-traditional family arrangements or the acceptance of extra-marital fertility, are contrasting with the moral norms of all the major churches in the Netherlands. Therefore we expected that religiosity as opposed to non-denominationalism would be more conductive for the *traditional* demographic patterns. Out of the most prominent religious groups, we expected that especially Calvinist denomination would correlate strongly with the *traditional behaviour.*

The cluster analysis indicated that the cluster, which includes the most traditionalistic Calvinist municipalities in the so-called Bible Belt really displays the most traditional demographic patterns, however, the contrasts – as compared with other clusters – were not particularly strong. Accordingly, the most *post-modern* behaviour was

typical of the strongly urbanized western part of the country. The regression analysis, on the other hand, revealed that it is especially the frequency of churchgoing which is still strongly associated with demographic behaviour.

These findings point out that the differences between behaviour of people belonging to different denominations have declined over time and once pronounced demographic contrasts between dominantly Catholic and Protestant regions do not play an important role any more. This does not necessarily mean that they have vanished altogether. For this is especially the two major streams of Protestantism that are now associated with regular churchgoing. Furthermore, the influence of Muslim faith might have been captured, to a certain extent by the proportion of first and second generation of non-western foreign-born (‘*allochtonen’*) women, of which the majority comes from the Muslim countries.

The major finding of our research is that religiosity serves as a strong and in some cases the most important predictor of regional demographic differences in the Netherlands, provides an invitation for further promising research, investigating the interaction between religiosity (and other cultural factors) and demographic behaviour over time, on the level of municipalities or from the life-course perspective, utilising the micro data collected by the surveys of family formation (*Onderzoek gezinsvorming)*.

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