

## REGIONAL INEQUALITIES OF CHILDREN DISABILITY INCIDENCE IN LITHUANIA

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**Key words:** incidence, disability, children, inequalities, counties, 2007-2011.

### Summary

Declining birth rates, increasing number of diseases and injuries among children, socio-economical change in the situation of the country, as well as other social, health - and economics-related factors are the main reasons for greater interest of scientists in research on the social and health disparities in the counties (municipalities and districts). This paper analyzes the inequalities in first-time recognized children's disability in counties of Lithuania during the period of 2007-2011.

**Aim of the study.** To analyze incidences of the first-time recognized children's disability in Lithuania from 2007 to 2011 and to compare the parameters of the first-time recognized children's disability incidence in 10 counties, taking into account variability of disability incidence inside the counties.

**Methods.** The study used the data on the initial determination of disability in children, taken from Disability and Working Capacity Assessment Office under the Ministry of Social Security and Labor from 2007-2011. For the usage of further statistical index, the information on the number of citizens was taken from the database of Department of Statistics of the Republic of Lithuania. The indicators were age-standardized using the direct standardization method and the statistical program "WinPepi". For the variation analysis of country's regional disparities the One-way ANOVA test was applied.

**Results.** During the analyzed period (2007-2011) in Lithuania some form of disability was found in 10649 children under the age of 18, of whom 6,219 - boys (58,0 percent) and 4,430 - girls (42,0 percent). The largest newly-recognized children's disability averages in 2007-2011 were found in the region of Šiauliai ( $43,68 \pm 1,70$ ), Panevėžys county

( $41,55 \pm 1,96$ ) and Utena county ( $41,53 \pm 6,27$ ). In boys' group - Šiauliai county ( $51,64 \pm 1,53$ ), Telšiai county ( $47,72 \pm 10,61$ ), Utena county ( $46,69 \pm 7,83$ ) and Panevėžys county ( $45,61 \pm 2,59$ ). In girls' group - Panevėžys ( $37,14 \pm 2,31$ ), Šiauliai ( $35,33 \pm 2,47$ ), and Utena ( $36,16 \pm 5,11$ ) counties. In both girls' and boys' groups statistically significant differences ( $p < 0,05$ ) in newly recognized children's disability incidence in the country's counties were found.

**Conclusions.** The conducted variation analysis of children's disability at the age of 0-17 y.o. in the period of 2007-2011 throughout the country's counties, revealed inequalities among the counties. The biggest differences in newly determined disability in children in comparison with other counties of the country were found among Šiauliai, Utena, and Panevėžys counties.

### Introduction

With declining birth rate in Lithuania, as well as number of children and young people, the number of elderly and senior-aged people is growing [1]. According to Lithuanian Department of Statistics in the beginning of the year 2012 in Lithuania there lived an average of 3,199,771 population [2]. In the beginning of 2012 in the country there lived 595,2 thousand, or 18,6 percent, of children under the age of 18. Since the beginning of 2007 the number of children in the country declined by 100,3 thousand, or 14,4 percent. In the beginning of 2012 there were 15,5 thousand more boys under 18 years of age than girls. Over the past five years, the number of boys has dropped by 50,8 thousand, the number of girls - by 49,5 thousand [3].

Children's health state is characterized by children's development disorders and child morbidity rates. For the past several years health statistics has been showing a deteriorating state of health of children population. With increasing age the number of children with functional health problems and children with chronic diseases is growing, as well as the number of children who had disability recognized for

the first time. In 2011 the number of children under 18 years of age with first-time recognized disabilities was 2040. (In 2010 there were 1974 children under the age of 18). Every third of their disabilities is due to mental and behavioral disorders [4]. According to the Ministry of Social Security and Labor the total number of children with disabilities up to the age of 18 in 2011 was 15,522, or 6 percent [5]. During the 1st and 2nd and 3rd quarters of 2012 some form of disability for the first time was determined in 1533 children under the age of 18 [6].

In recent years with the prevalence of income inequalities, high unemployment rates, decreasing birth rate, increased migration flows; it has become more difficult for a large part of population with low income rate to access health services. The listed problems encourage researchers to investigate and analyze social and economic differences, as well as economic differences among geographic counties and look for ways to reduce them [7]. Both foreign and Lithuanian authors in their scientific work more and more often analyze the development of countries and counties, regional differences in an attempt to identify the cause of appearance of economic, social, environmental differences and unevenness.

The scientific literature on regional development disparities analyses it from different aspects. J. Novotny (2007) analyzed the regional inequality on income level, and S. Rengansamy (2009) - not only on income or production level, but also on the level of opportunities in the region to receive services, employment. I. Kasinskaitė (2005) based country and regional differences on information and communication technology development and its use in various social and economic spheres of activities. T. Sorensen (2000) analyzed the problem from the perspective of inequality (as different levels of wealth among counties) and the differences in economic and social structure. D. Verkulevičiūtė (2009) focused her attention on socio-territorial differences. A. Misiūnas, Ž. Svetikas (2003) were studied of inequalities in municipal economic development [8-13].

Researchers refer to a range of causes of economic, social and environmental disparities in the counties. Some authors name the region's geographic and physiographic features, historical and cultural experience, others - lack of co-ordination of the development process and free competition, which is obstructing the leveling of regional disparities [7].

The researches of other Lithuanian and foreign authors have shown that the regional development disparities and differences, as a scientific object, is quite problematic, and its assessment is a complicated process. Therefore, the academic society has not yet formed a unified methodology of

evaluation of regional development and inequalities; and different researchers interpret the concept of regional development and disparities differently and assess it differently [7].

**The main aim of the study** - analysis of disability incidence in children under 18 years of age during 2007-2011 and evaluation of incidence inequalities in 10 counties of the country, identifying differences among them taking into account municipalities, consisting county.

#### Data and methods

The study used the data of the first-time recognition of children disability from the database of the Disability and Working Capacity Assessment Office under the Ministry of Social Security and Labor. Basic data on the new children's disability cases was grouped into four age groups in all 60 municipalities (lith. *savivaldybė*) in the country (0-4, 5-9, 10-14, 15-17). Each municipality administratively belonging to one particular county. *County* (lith. *apskritis*) in this work is defined as a component of the bigger socio-economic area, consisting from several municipalities, which is different from others other surrounding territories in economic, social, demographic, historical, cultural, natural, political or infrastructure systems. Here are 10 counties in the country.

Data on the number of population the country's municipalities in all age groups (0-4, 5-9, 10-14, 15-17) was taken from the Lithuanian Department of Statistics indicator's database. The direct data standardization method was applied to standardize analyzed indicators (European standard). Data standardization was performed using a statistical program WinPepi [13]. For the variability analysis of disability incidence in the counties by municipalities, the analysis of one way ANOVA was used. Normality of incidence data distribution was tested using Shapiro-Wilk test, which is more appropriate in our case because the samples used were low (<50). In case of not correspondence to the normal, the logarithms of the rates was used for analysis. To determine statistical significance of the differences between different counties, the Games-Howell test was applied [13].

#### Results

During the analyzed period, certain disabilities were recognized in 10649 children, of whom 4430 (42,0 percent.) were girls and 6219 (58,0 percent) - boys. As is seen in Table 1, the largest newly recognized children's disability rate per 1,000 children was recorded in 2009 (3,9 cases per 1,000 boys and 3,0 cases per 1,000 girls) (Table 1). In 2010 this ratio slightly declined, and in 2011 it reached previous level (3,9 per 1,000 boys and 2,9 per 1,000 girls) (Table 1).

As is obvious from Table 2, according to the severity level of disability in all analyzed years the mild first-time disability in children was slightly more than half (from 52,0 percent up to 57,0 percent) of all children disability cases. A little more than one-third of children with disabilities (from 35,0 to 37,0 percent) were recognized having the average level of severity. Severe disability in 2007-2011 ranged from 7,0 to 11,0 percent in all children with disabilities group (Table 2).

Table 3 presents the newly recognized disability rate with children under 17 years of age per 10,000 of population in 2007-2011 in Lithuanian counties.

**Table 1.** The cases of newly recognized children's disabilities and their frequency per 1,000 children in Lithuania in 2007-2011.

Children (under 18)	2007	2008	2009	2010	2011
Boys, recognized with disability for the first time	1272	1332	1275	1146	1194
Recognized as disabled per 1,000	3,6	3,9	3,9	3,6	3,9
Girls, recognized with disability for the first time	898	911	947	828	846
Recognized as disabled per 1,000	2,7	2,8	3,0	2,7	2,9

**Table 2.** The newly recognized children's disabilities, 2007-2011, according to the severity level of disability.

	2007	2008	2009	2010	2011
	n/ %	n/ %	n/ %	n/ %	n/ %
Total	2170 / 100,0	2243 / 100,0	2222 / 100,0	1974 / 100,0	2040 / 100
Severe	237/11,0	210/ 9,0	185 / 8,0	138 / 7,0	157 / 8,0
Average	798/ 37,0	837 / 37,0	776 / 35,0	707 / 36,0	718 / 35,0
Mild	1135/ 52,0	1196 / 53,0	1261 / 57,0	1129 / 57,0	1165 / 57,0

**Table 3.** The newly recognized disability incidence in children under 17 years of age for the period of 2007-2011 per 10,000 population (standardized disability incidence rate).

Region	Both genders (cases/10,000 pop.)	Boys (cases/10, 000 pop.)	Girls (cases/10, 000 pop.)
Šiauliai	42,95	51,01	34,58
Alytus	32,13	35,78	28,38
Kaunas	31,38	34,15	28,45
Klaipėda	31,33	35,84	26,55
Vilnius	31,33	29,25	21,35
Utena	43,11	49,38	36,46
Tauragė	38,12	42,9	33,05
Panevėžys	42,5	48,38	36,33
Marijampolė	31,92	35,18	28,47
Telšiai	40,36	49,12	31,13

As can be seen in the third table, the biggest first-time recognized disability incidence rates are found in Šiauliai (42,9 cases/10,000 pop.), Utena (43,11 cases/10,000 pop.) and Panevėžys (42,5 cases/10,000 pop.) counties. The most disabled boys in 2007-2011 were newly recognized in the Šiauliai (51,01 cases/10,000 pop.), Utena (51,01 cases/10,000 pop.) and Telšiai (49,12 cases/10,000 pop.) counties. The most for the first time recognized disabled girls were found in Utena (36,46 cases/10,000 pop.), Panevėžys (36,33 cases/10,000 pop.) and Šiauliai (34,58 cases/10,000 pop.) counties (Table 3).

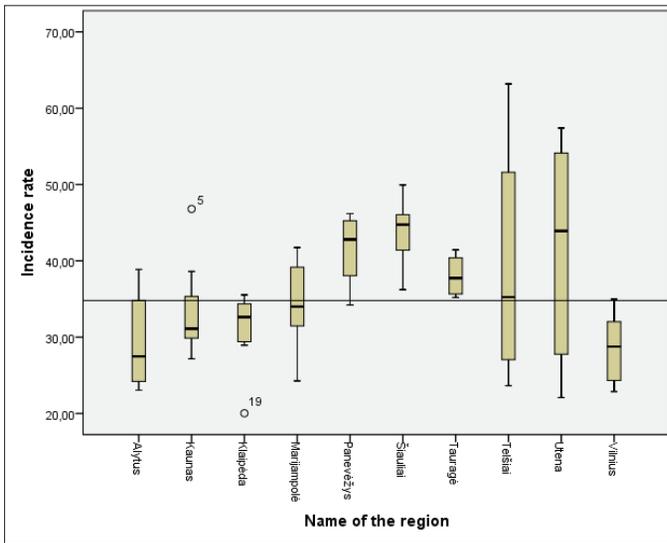
According to the International Statistical Classification of Diseases and Related Health Problems (ICD-10), the most common health problems that influence children's disability from 2007 to 2011 were mental and behavioral disorders (3790 cases or 36,0 percent of all the disability cases during the analyzed period of time), which, according to frequency, were followed by inborn malformations, deformations and chromosomal abnormalities (1870 cases or 18,0 percent of all the disability cases in the given period) and neurological diseases (1020 cases, or 10,0 percent of all the disability cases during the analyzed period).

**The differences of children's disability incidence among Lithuanian counties and inside of them.** The analysis of children (0-17) disability incidence data in the counties suggests that the biggest newly recognized children's disability rate in 2007-2011 found in the Šiauliai region (rate –  $43,68 \pm 1,70$ ), Panevėžys region (rate –  $41,55 \pm 1,96$ ) and Utena region (rate –  $41,53 \pm 2,47$ ). The smallest children (0-17) disability rate over the period of 2007-2011 is in the region of Vilnius (rate -  $28,51 \pm 1,56$ ).

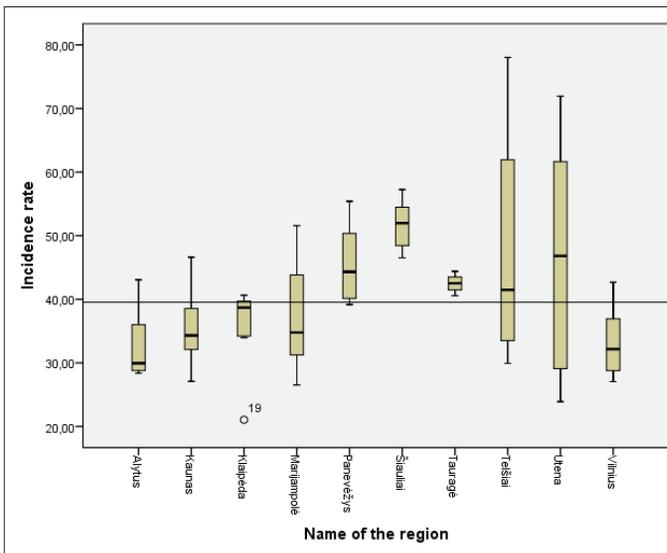
After application of one-way ANOVA test, it was found statistically significant differences, of disability incidence by region ( $F_{(9;18,4)}=5,423$ ;  $p=0,001$ ). Also, test results revealed that statistically significant differences between newly recognized disability rates were found between Klaipėda and Šiauliai counties ( $p=0,039$ ), Šiauliai and Vilnius counties ( $p=0,001$ ), Panevėžys and Vilnius counties ( $p=0,006$ ) and Tauragė and Vilnius regional rates ( $p=0,025$ ) (Figure 1).

As may be seen, in Kaunas and Klaipėda counties two municipalities stand out. Kaunas region ratio is particularly far deviated towards the bigger half from the county's data center ("5" - Birštonas municipality). During the analyzed period Birštonas municipality's newly diagnosed disability number remained similar. Also, it was found, that Birštonas municipality from 2007 to 2011 witnessed a reduction in the rate population within 10-14 and 15-17 age groups, especially among girls. This may be one of explanation of this extreme rate.

Klaipėda region ("19" - Palanga municipality) demons-



**Figure 1.** The comparison of the newly recognized children's (0-17) disability average in counties of the country, 2007-2011.



**Figure 2.** The comparison of the newly recognized boys's (0-17) disability incidence in the counties of the country, 2007-2011.

trates the opposite situation, when the outstanding rate is below the one of the data center. The number of newly recognized disabilities is slightly higher in this municipality in 2008; in other analyzed years it remained similar to the one of 2007, which could possibly affect the local peculiarity.

The tendency that stands out in Figure 1 is Utena and Telšiai counties, where extreme variability (largest “box”-es) of counties can be observed, compared with other coun-

ties of the country. It was detected that disability incidence in the counties subunits (municipalities') during the period significantly varied.

Among boys, the incidence of children's disability strongly varied in country's counties. The biggest first-time recognized disability rate for children (0-17) in 2007-2011 among boys was found in the Šiauliai (rate –  $51,64 \pm 1,53$ ), Telšiai (rate –  $47,72 \pm 10,61$ ), Utena (rate –  $46,69 \pm 7,83$ ) and Panevėžys counties (rate –  $45,61 \pm 2,59$ ).

Statistically significant differences in disability incidence among boys were also found among the country's counties ( $F_{(9;18,6)} = 7,996$ ;  $p = 0,000$ ).

The most notable statistically significant differences between the newly recognized disability rates were found between Šiauliai and Alytus counties ( $p = 0,037$ ), Šiauliai and Kaunas counties' childhood disability rates ( $p = 0,003$ ), Šiauliai and Tauragė counties rates ( $p = 0,008$ ), Šiauliai and Vilnius counties rates ( $p = 0,001$ ), between Vilnius and Panevėžys counties rates ( $p = 0,036$ ), and between Vilnius and Tauragė counties rates ( $p = 0,040$ ) (Fig. 2). As was mentioned above, describing the graph, (Figure 2) analyzing counties differences in disability average among boys, remains the same outlier, below the data center.

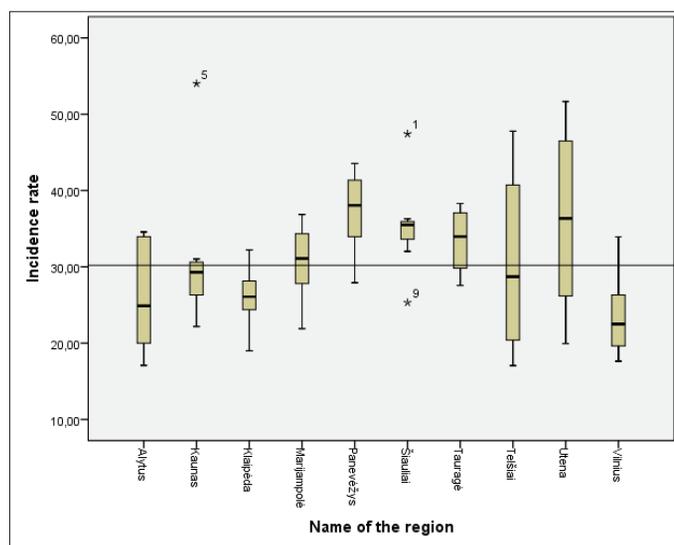
After the variance analysis of the data group of girls quite high inequalities in the counties were also discovered ( $F_{(9;18,2)} = 3,081$ ;  $p = 0,020$ ). The largest newly-recognized disability incidence among girls was recorded in Panevėžys (rate –  $37,14 \pm 2,31$ ), Šiauliai region (rate –  $35,33 \pm 2,47$ ), and Utena counties (rate –  $36,16 \pm 12,56$ ).

In the girls' group the most statistically significant differences were between Vilnius and Šiauliai counties rates ( $p = 0,034$ ) and Vilnius and Panevėžys counties rates ( $p = 0,013$ ) (Fig. 3).

Analysis of the data group of girls, in addition to the previously discussed outlier in Kaunas region, showed two outliers in Šiauliai region, located above and below the data center. Šiauliai region's higher outlier is in Akmenė municipality, in which as of 2009 a significant decrease in the average annual population of all ages (0-4, 5-9, 10-14, 15-17) can be observed, which could have influenced high level of incidence rate.

### Conclusions

1. The first-time recognized children's (0-17) disability incidence analysis revealed significant inequalities among the counties of the country and inside of



**Figure 3.** The comparison of the newly recognized girls' (0-17) disability average in the counties of the country, 2007-2011.

them. The largest newly established children's disability incidence rates, compared with other counties of the country, were found in Šiauliai, Utena, and Panevėžys ( $p < 0,05$ ) counties. Large incidence variability, in comparison with other counties of the country, is visible in Telšiai and Utena counties.

2. Observed regional differences could be influenced by subjective and/or objective reasons. In order to find out the cause that led to disparity in our particular case, it is necessary to take into account the children's morbidity data of the analyzed period. Although the health statistics for the last few years shows the country's deteriorating children's health state and decreasing number of children under 17 years of age, the newly recognized children's disability inequalities in the counties may be influenced by subjective reasons such as differences in activeness and work quality of the institutions, taking part in disability assessment.

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## NAUJAI IŠAIŠKINTO VAIKŲ NEĖGALUMO NETOLYGUMAI LIETUVOS APSKRITYSE J. Raistenskis, Z. Skvarciany, R. Gurevičius

Raktažodžiai: naujai pripažinta negalia, dažnis, vaikai, netolygumai, apskritys, 2007–2011 m.

Santrauka

Mažėjantis gimstamumas, didėjantis sergančiųjų dėl ligų ir traumų vaikų skaičius, socialinės ekonominės situacijos kaita šalyje, kiti sveikatos ir socialiniai bei ekonominiai veiksniai sąlygoja didesnį tyrėjų dėmesį socialiniams bei sveikatos netolygumų tyrimams šalies regionuose (savivaldybėse, apskrityse). Šiame darbe analizuojame pirmą kartą pripažintos vaikų negalios netolygumus Lietuvos regionuose 2007–2011 m.

Tyrimo tikslas. Išanalizuoti pirmą kartą pripažintos vaikų negalios atvejų dažnį Lietuvoje 2007–2011 m. laikotarpiu bei palyginti pirmą kartą pripažintos vaikų negalios parametrus 10 apskričių, tarp jų nustatant regioninius negalumo dažnio netolygumus, atsižvelgiant į dažnį savivaldybėse.

Metodika. Tyrime panaudoti Neįgalumo ir darbingumo nustatymo tarnybos prie Socialinės apsaugos ir darbo ministerijos pirminiai vaikų neįgalumo nustatymo 2007–2011 m. duomenys. Tolesniems statistiniams rodikliams naudoti duomenys apie gyventojų skaičių metų pradžioje imti iš Lietuvos Respublikos Statistikos departamento rodiklių duomenų bazės. Rodikliai standar-

tizuoti pagal amžių panaudojant tiesioginį standartizacijos metodą ir statistinę programą „Winpepi“. Variacinei šalies regioninių netolygumų analizei taikyta vienmatė dispersinė analizė.

Rezultatai. Analizuojamu periodu (2007-2011 m.) Lietuvoje pirmą kartą vienokia ar kitokia negalė buvo nustatyta 10649 vaikams iki 18 m. amžiaus, iš jų 6219 berniukams (58,0 proc.) ir 4430 mergaitėms (42,0 proc.). Didžiausi naujai pripažintos vaikų negalumo vidurkiai 2007–2011 m. laikotarpiu rasti Šiaulių apskrityje ( $43,68 \pm 1,70$ ), Panevėžio apskrityje ( $41,55 \pm 1,96$ ) ir Utenos apskrityje ( $41,53 \pm 6,27$ ). Berniukų grupėje – Šiaulių apskrityje ( $51,64 \pm 1,53$ ), Telšių apskrityje ( $47,72 \pm 10,61$ ), Utenos apskrityje ( $46,69 \pm 7,83$ ) ir Panevėžio apskrityje ( $45,61 \pm 2,59$ ). Mergaičių grupėje – Panevėžio ( $37,14 \pm 2,31$ ), Šiaulių ( $35,33 \pm 2,47$ ) bei Utenos ( $36,16 \pm 5,11$ ) apskrityse. Ir mergaičių, ir berniukų grupėse tarp naujai pripažintos vaikų negalumo dažnio rodiklių šalies aps-

kirtyse rasti statistiškai reikšmingi skirtumai ( $p < 0,05$ ).

Išvados. Atlikta naujai nustatytos 0–17 m. vaikų negalumo variacinė analizė 2007–2011 m. laikotarpiu šalies regionuose atskleidė vaikų naujai pripažintos negalios dažnio netolygumus tarp šalies apskričių. Didžiausi naujai nustatyto vaikų negalumo skirtumai lyginant su kitais šalies regionais buvo Šiaulių, Utenos, ir Panevėžio apskrityse.

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