Improvements in Perinatology in the Republic of Moldova

Many Successes, remaining challenges

Analysis of Feto-Infant Mortality Data

Prof. Petru Stratulat
Dr. Ala Curteanu
Mother and Child Institute
Chisinau, Republic of Moldova

Perinatal Medicine 2015
The "Perinatal Medicine" Subgroup of "The Society of Maternal-Fetal Medicine and Perinatology of Turkey"
"South East European Society of Perinatal Medicine"
23 – 25 April 2015, Istanbul, Turkey

Prof. Petru Stratulat

1948-2015

- The President of the Association of Perinatal Medicine since 2000
- The Leader of the reform in Perinatal care since 1998
- The Founder of the Scool of Neonatology since 1983
- The Chief of the Department of Neonatology-Pediatrics of the Medical University
- The Director of the WHO Coolaborative Centre entitled „Promotion of appropriate technologies in perinatal care” (2006-2010)
- The Director of the WHO Making Pregnancy Safer Initiative in Moldova

Phases of reform of Perinatal health system

- **3 major phases:**
  - creation and strengthening (1998-2002)

    Strengthening perinatal health Governmental Program

    unicef
  - optimization (2003-2007)

    unicef

    Schweizerische Eidgenossenschaft
    Confédération suisse
    Confederazione Svizzera
    Confederaziun svizra

    Swiss Agency for Development and Cooperation SDC

    Promoting Quality Services in Perinatal Care Project
  - modernization (2006-2014)

    Schweizerische Eidgenossenschaft
    Confédération suisse
    Confederazione Svizzera
    Confederaziun svizra

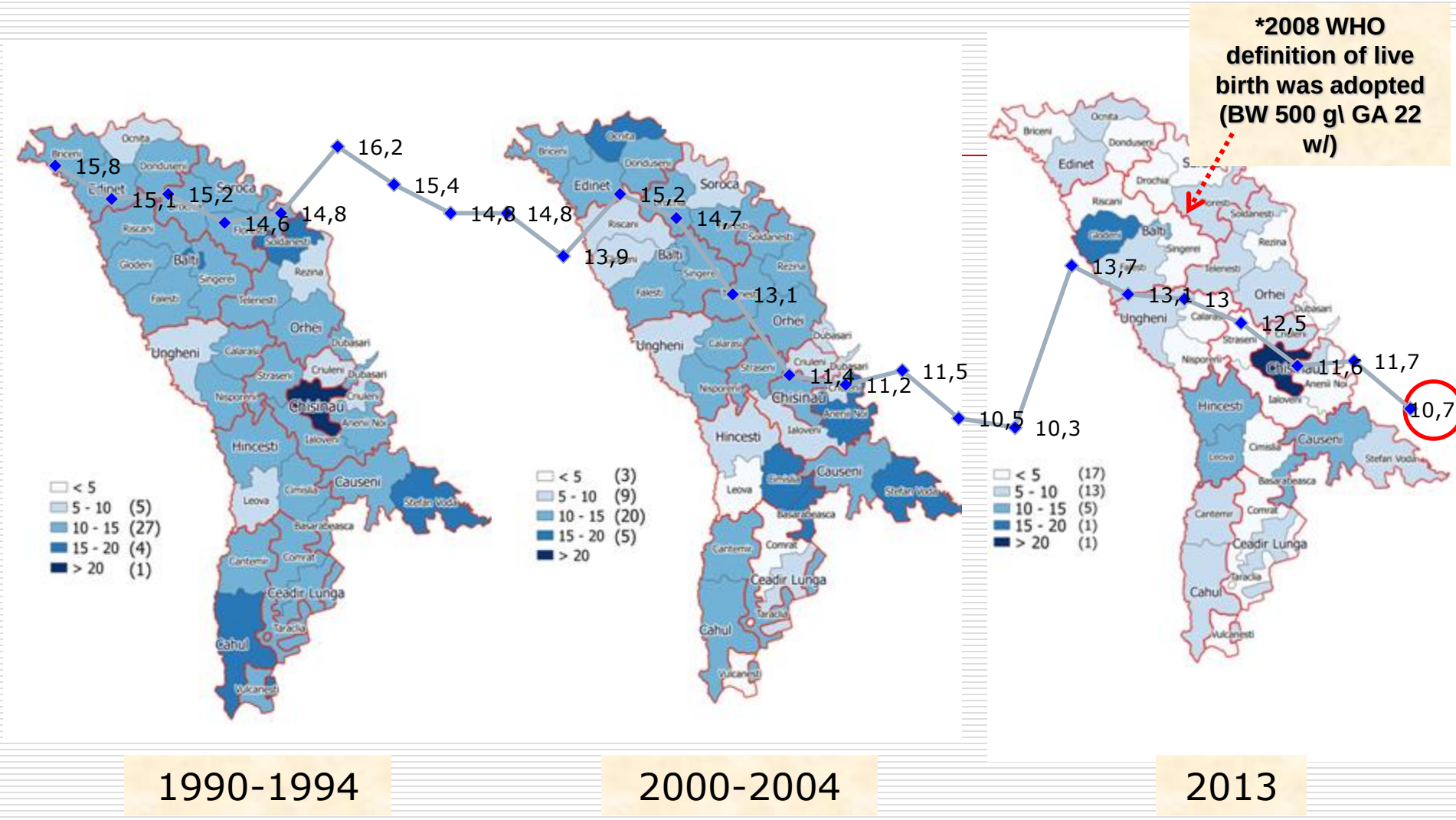
    Swiss Agency for Development and Cooperation SDC

    Modernising perinatal care Moldo-Swiss Project
- having prominently contributed to the reduction of IM on account of ENM (by 50%).

Health and system interventions implemented in different stages of the system reform

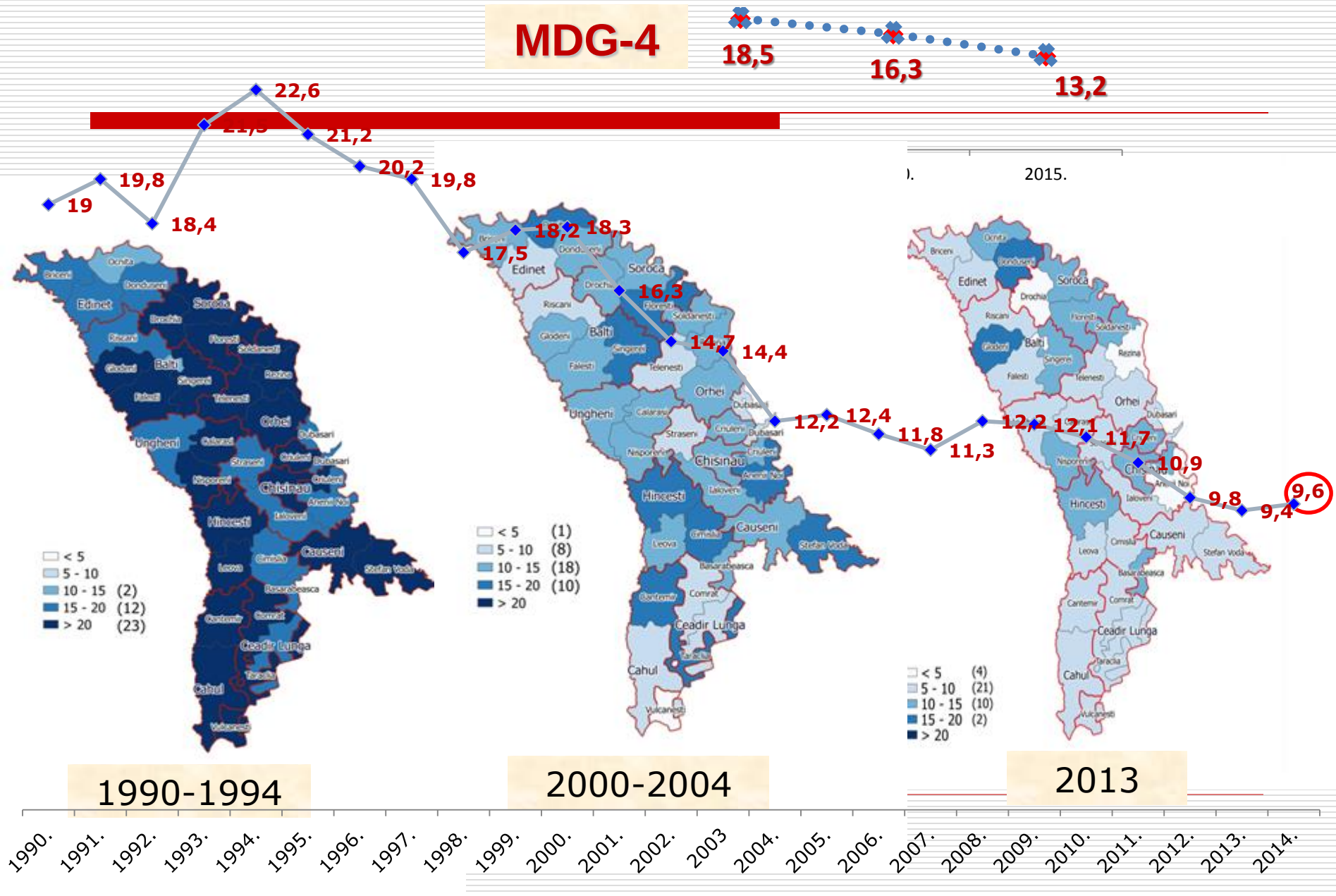
Interventions	Phases of reform		
	I	II	III
Regionalization / referral system in 3 levels	×	×	×
National policies in perinatal health	×	×	
Endowment maternities with equipment	×		×
Monitoring system of MCH using Babies matrix	×	×	×
EB cost-effective interventions implementation in MW	×	×	×
EB cost-effective interventions implementation in PHC		×	
Clinical protocols in Obstetrics & Neonatology		×	×
Community mobilisation: 2 national campaigns, Family Clubs		×	×
Improved QofCare: High-tech interventions for ELBW babies			×
Simulation courses in Obs.&Neon. EmCare			×
Post-NICU Follow-up service			×
New QM tools: QI projects, clinical audit, benchmarking			×
Health Technology Management			×

Trend of Perinatal mortality rate, 1990-2014



1990. 1991. 1992. 1993. 1994. 1995. 1996. 1997. 1998. 1999. 2000. 2001. 2002. 2003. 2004. 2005. 2006. 2007. 2008. 2009. 2010. 2011. 2012. 2013. 2014.

Trend of Infant mortality rate, 1990-2014



Results

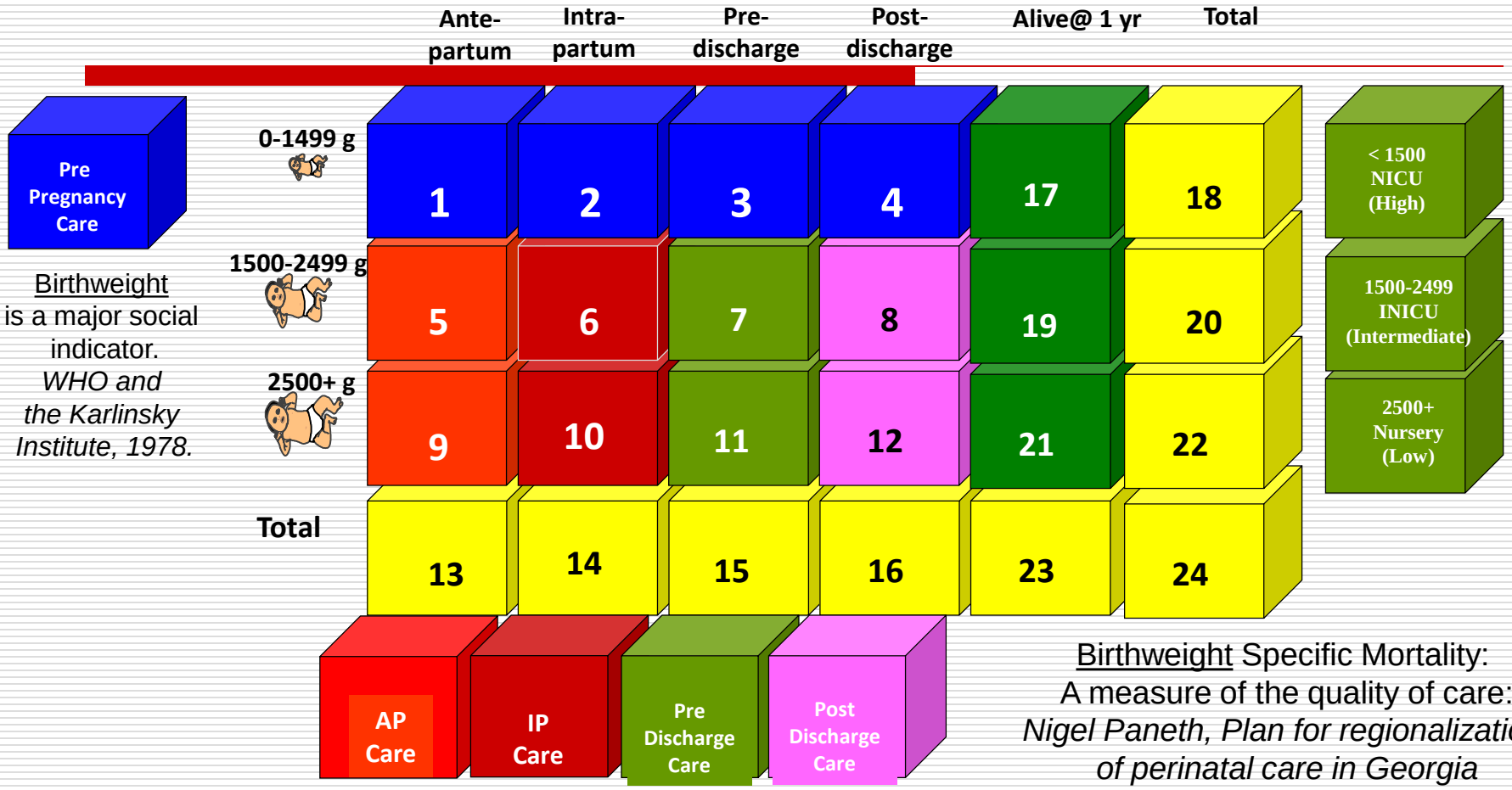
- Perinatal Mortality Decrease
- Regionalization works
- BWSMRs reduced
- Gap Analysis
- What is next?

The objectives for this study are:

- to compare the point estimates in Moldovan FIMR from three time periods: 2000-01, 2005-06, and 2011-12 corresponding to the periods of the program over time;
- to use the BABIES model to determine which intervention packages along the "continuum of care" have yielded the greatest reductions in mortality during this timeframe;
- to identify intervention strategies with the potential to further reduce the FIMR.

Data source

Babies and Intervention Packages



Birthweight is a major social indicator. *WHO and the Karlinsky Institute, 1978.*

Birthweight Specific Mortality: A measure of the quality of care: *Nigel Paneth, Plan for regionalization of perinatal care in Georgia*

Birthweight Proportionate Mortality: An indicator for decision makers. *The Healthy Newborn: A Manual for the program manager, CDC/CARE 2000*.

Birthweight **A**ge-at-death **B**oxes for **I**nterventions and **E**valuation **S**ystem matrix

CDC/CARE Manual

Using BABIES to identify priority intervention packages

Pre-pregnancy health

Family Planning
Nutrition
"ART" for complications
Substance Abuse
Anticipatory Guidance

NICU Care for < 1500 gms

Pre-pregnancy health

Care during pregnancy | Care During delivery | Newborn Care | Post-discharge care

Postdischarge Care

Immunizations
Rx ARI
Breast Feeding
Rx Diarrhea
Injury prevention
Malaria Rx

Care during pregnancy

"ART" for Medical Problem
High Risk Maternal Follow-up
Anticipatory Guidance

Care during delivery

Anticipatory Guidance
Intrapartum monitoring
“ART for medical complications
“ART” for surgical complications

Newborn Care

Resuscitation
Thermal Control
Breast Feeding
"Baby Friendly" Concept
High Risk Infant Followup

Minimum data collected by every birth facility in Moldova

BABIES Moldova 2001-2002								
Grups / Birth weight	AP	IP	0-6d	7 - 28 d	PNM	Alive	Alive @ 1 year	Total births
< 1500	326	101	226	24	9	415	164	842
1500 - 2499	127	28	148	125	88	3382	3109	3537
2500+	164	109	244	502	419	68823	68077	69096
Total	617	238	618	652	517	72620	71350	73475

BABIES Moldova 2006-2007								
BthWt Grp	AP	IP	0-6d	7 - 28 d	PNM	Alive	Alive @ 1 year	Total births
< 1500	217	62	219	37	13	451	188	730
1500 - 2499	120	15	107	78	38	3457	3267	3592
2500+	143	50	156	351	282	71392	70876	71585
Total	480	127	482	466	333	75300	74331	75907

BABIES Moldova 2011-2012								
BthWt Grp	AP	IP	0-6d	7 - 28 d	PNM	Alive	Alive @ 1 year	Total births
< 1500	173	32	196	58	27	600	348	805
1500 - 2499	111	19	93	64	42	3401	3261	3531
2500+	153	57	115	292	221	75170	74744	75380
Total	437	108	404	414	290	79171	78353	79716

BABIES Format for Level III & Level II 5 R Table, Moldova 2011-12

BABIES Count Table:Moldova, 2001-02

BthWt Grp	Results													
	Fetal results			Infant results										
	Prebirth death			Predischarge Death				Postdischarge death						
	AP - out	AP -in	IP	< 1 day	1 - 6 d	7 - 28 d	PNM	< 1 day	1 - 6 d	7 - 28 d	PNM	Live births	Alive @ 1 year	Total
< 1500	293	33	101	139	87	2	0	0	0	13	9	415	164	842
1500 - 2499	105	22	28	68	80	7	0	0	0	30	88	3382	3109	3537
2500+	147	17	109	114	130	8	0	0	0	75	419	68823	68077	69096
Total	545	72	238	321	297	17	0	0	0	118	517	72620	71350	73475

BABIES Count Table:Moldova, 2006-07

BthWt Grp	Fetal results			Infant results										
	Prebirth death			Predischarge Death				Postdischarge death						
	AP - out	AP -in	IP	< 1 day	1 - 6 d	7 - 28 d	PNM	< 1 day	1 - 6 d	7 - 28 d	PNM	Live births	Alive @ 1 year	Total
< 1500	202	15	62	94	132	8	0	0	0	16	13	451	188	730
1500 - 2499	111	9	15	53	59	10	0	0	0	30	38	3457	3267	3592
2500+	133	10	50	75	90	9	0	0	0	60	282	71392	70876	71585
Total	446	34	127	222	281	27	0	0	0	106	333	75300	74331	75907

BABIES Count Table:Moldova, 2011-12

BthWt Grp	Fetal results			Infant results										
	Prebirth death			Predischarge Death				Postdischarge death						
	AP - out	AP -in	IP	< 1 day	1 - 6 d	7 - 28 d	PNM	< 1 day	1 - 6 d	7 - 28 d	PNM	Live births	Alive @ 1 year	Total
< 1500	150	23	32	109	85	17	0	0	0	14	27	600	348	805
1500 - 2499	103	8	19	42	34	3	0	0	0	19	42	3401	3261	3531
2500+	143	10	57	73	61	3	0	0	0	68	221	75170	74744	75380
Total	396	41	108	224	180	23	0	0	0	101	290	79171	78353	79716

Table 1: Level III & II 5 R Table

PreC Risk	AP Risk	IP Risk	MOD	MOD Type	BABIES	Populations				
Urban	18+ YOA,	No Path	Vag	Natural	BABIES	1	25	33	37	39
			C-sec	Planned	BABIES	2				
				Urgent/Em	BABIES	3				
		Path	Vag	Natural	BABIES	4	26			
			C-sec	Planned	BABIES	5				
				Urgent/Em	BABIES	6				
	< 18 YOA	No Path	Vag	Natural	BABIES	7	27	34		
			C-sec	Planned	BABIES	8				
				Urgent/Em	BABIES	9				
		Path,	Vag	Natural	BABIES	10	28			
			C-sec	Planned	BABIES	11				
				Urgent/Em	BABIES	12				
Rural	18+ YOA,	No Path	Vag	Natural	BABIES	13	29	35	38	
			C-sec	Planned	BABIES	14				
				Urgent/Em	BABIES	15				
		Path	Vag	Natural	BABIES	16	30			
			C-sec	Planned	BABIES	17				
				Urgent/Em	BABIES	18				
	< 18 YOA	No Path	Vag	Natural	BABIES	19	31	36		
			C-sec	Planned	BABIES	20				
				Urgent/Em	BABIES	21				
		Path,	Vag	Natural	BABIES	22	32			
			C-sec	Planned	BABIES	23				
				Urgent/Em	BABIES	24				

Perinatal Mortality Decrease

Table 1: BABIES by Time Periods. Table 1A: BABIES Moldova 2001-2002

Birthweight Group	Indicator	AP	IP	0-6d	7- 28 d	PNM	Live births	Total
< 1500	Count	326	101	226	15	9	415	842
	BWPMRs	4.4	1.4	3.1	0.2	0.1		9.2
1500 - 2499	Count	127	28	148	37	88	3382	3537
	BWPMRs	1.7	0.4	2.0	0.5	1.2		5.8
2500+	Count	164	109	244	83	419	68823	69096
	BWPMRs	2.2	1.5	3.3	1.1	5.7		13.9
Total	Counts	**617**	**238**	**618**	**135**	**517**	**72620**	**73475**
	Total	**8.4**	**3.2**	**8.4**	**1.8**	**7.0**		**28.9**

Table 1B: BABIES Moldova 2006-2007

< 1500	Count	217	62	226	24	13	451	730
	BWPMRs	2.9	0.8	3.0	0.3	0.2		7.1
1500 - 2499	Count	120	15	112	40	38	3457	3592
	BWPMRs	1.6	0.2	1.5	0.5	0.5		4.3
2500+	Count	143	50	165	69	282	71392	71585
	BWPMRs	1.9	0.7	2.2	0.9	3.7		9.3
Total	Counts	**480**	**127**	**503**	**133**	**333**	**75300**	**75907**
	Total	**6.3**	**1.7**	**6.6**	**1.8**	**4.4**		**20.8**

Table 1C: BABIES Moldova 2011-2012

< 1500	Count	173	32	194	31	27	600	805
	BWPMRs	2.2	0.4	2.4	0.4	0.3		5.7
1500 - 2499	Count	111	19	76	22	42	3401	3531
	BWPMRs	1.4	0.2	1.0	0.3	0.5		3.4
2500+	Count	153	57	134	71	221	75170	75380
	BWPMRs	1.9	0.7	1.7	0.9	2.8		8.0
Total	Counts	**437**	**108**	**404**	**124**	**290**	**79171**	**79716**
	Total	**5.5 / 35%**	**1.4/ 58%**	**5.1/ 40%**	**1.6/ 15%**	**3.6/ 48%**		**17.1/ 41%**

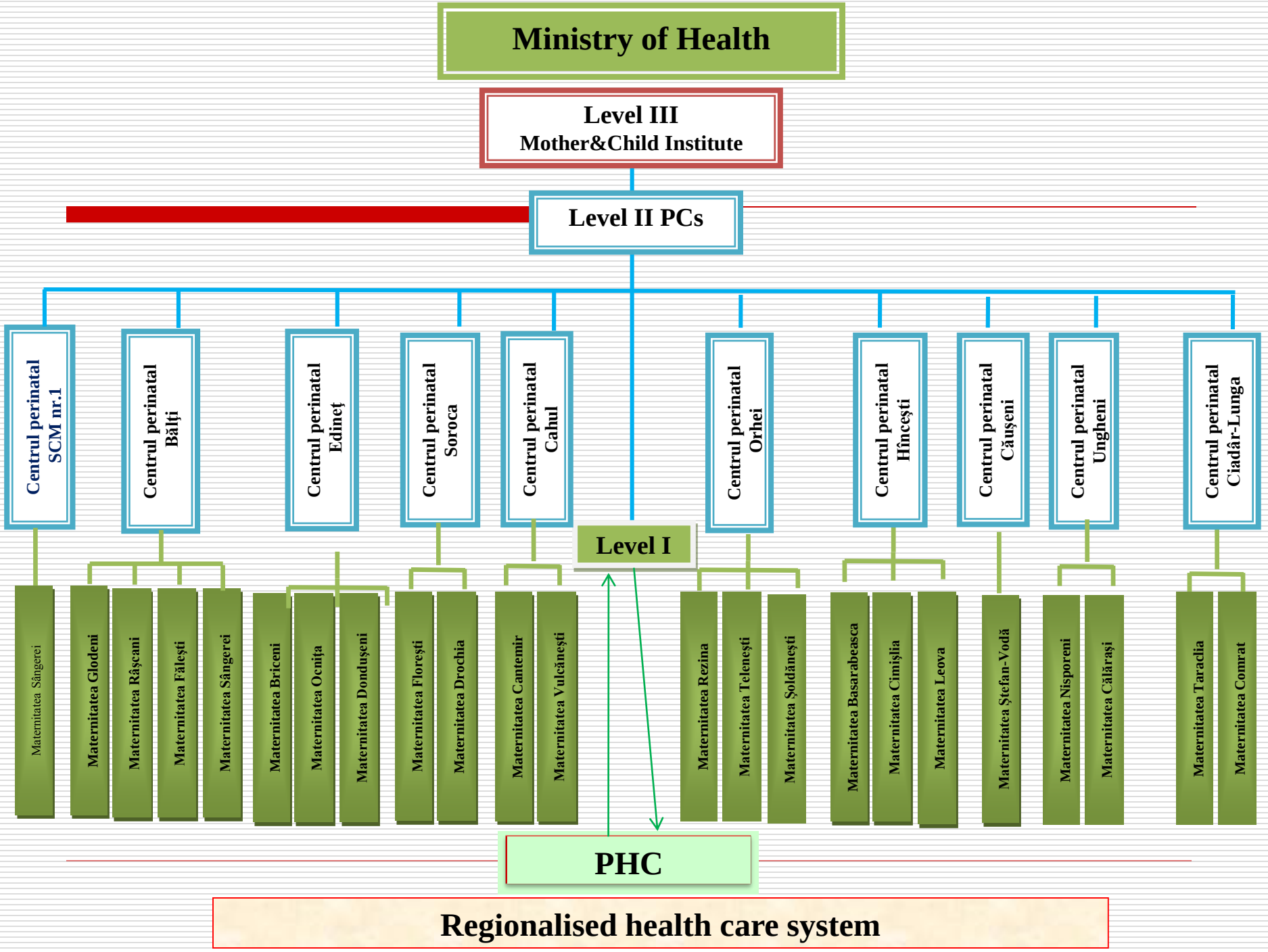
Comparison of BWPMRs by Intervention Packages for three time periods in Moldova

Intervention Package	2001-2002		2006-2007		2011-2012	
	BWPMRs	Difference 2001/2002 2011/2012	BWPMRs	Difference 2001/2002 2006/2007	BWPMRs	Difference 2006/2007 2011/2012
MH	9.2	38%	7.1	23%	5.7	20%
MC/AP	4.0	16%	3.5	13%	3.3	4%
MC/IP	1.9	49%	0.9	54%	1.0	-11%
PreD	7.0	45%	5.1	27%	3.8	25%
PostD	6.9	52%	4.2	39%	3.3	22%
Total	**28.9**	**41%**	**20.8**	**28%**	**17.1**	**18%**

Which intervention package has the greatest potential for reducing FIM?

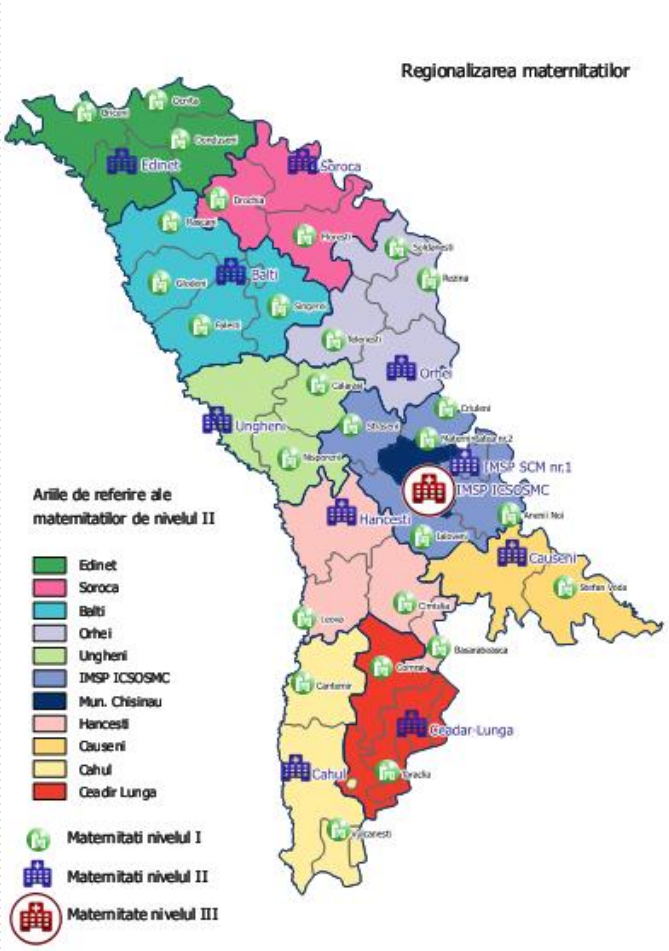
Regionalization works

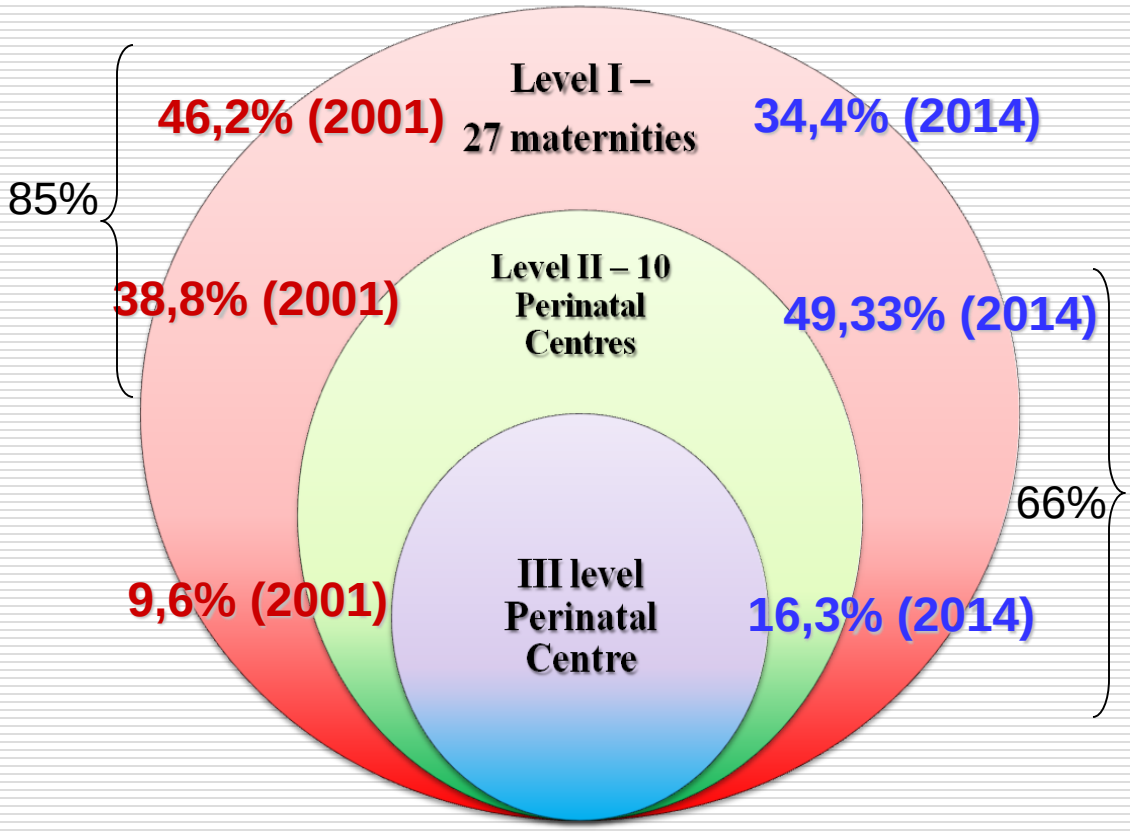
Statement: Regionalization of Perinatal Care is the most cost-effective mechanism for ensuring the best outcome


Ministry of Health
Level III
Mother&Child Institute
Level II PCs
Centrul perinatal SCM nr.1
Centrul perinatal Bălți
Centrul perinatal Edineț
Centrul perinatal Soroca
Centrul perinatal Cahul
Centrul perinatal Orhei
Centrul perinatal Hîncești
Centrul perinatal Căușeni
Centrul perinatal Ungheni
Centrul perinatal Ciadîr-Lunga
Level I
Maternitatea Sîngerei
Maternitatea Glodeni
Maternitatea Rîșcani
Maternitatea Fălești
Maternitatea Sîngerei
Maternitatea Briceni
Maternitatea Ocnița
Maternitatea Dondușeni
Maternitatea Florești
Maternitatea Drochia
Maternitatea Cantemir
Maternitatea Vulcănești
Maternitatea Rezina
Maternitatea Telenești
Maternitatea Șoldănești
Maternitatea Basarabeasca
Maternitatea Cimișlia
Maternitatea Leova
Maternitatea Ștefan-Vodă
Maternitatea Nisporeni
Maternitatea Călărași
Maternitatea Taraclia
Maternitatea Comrat
PHC
Regionalised health care system

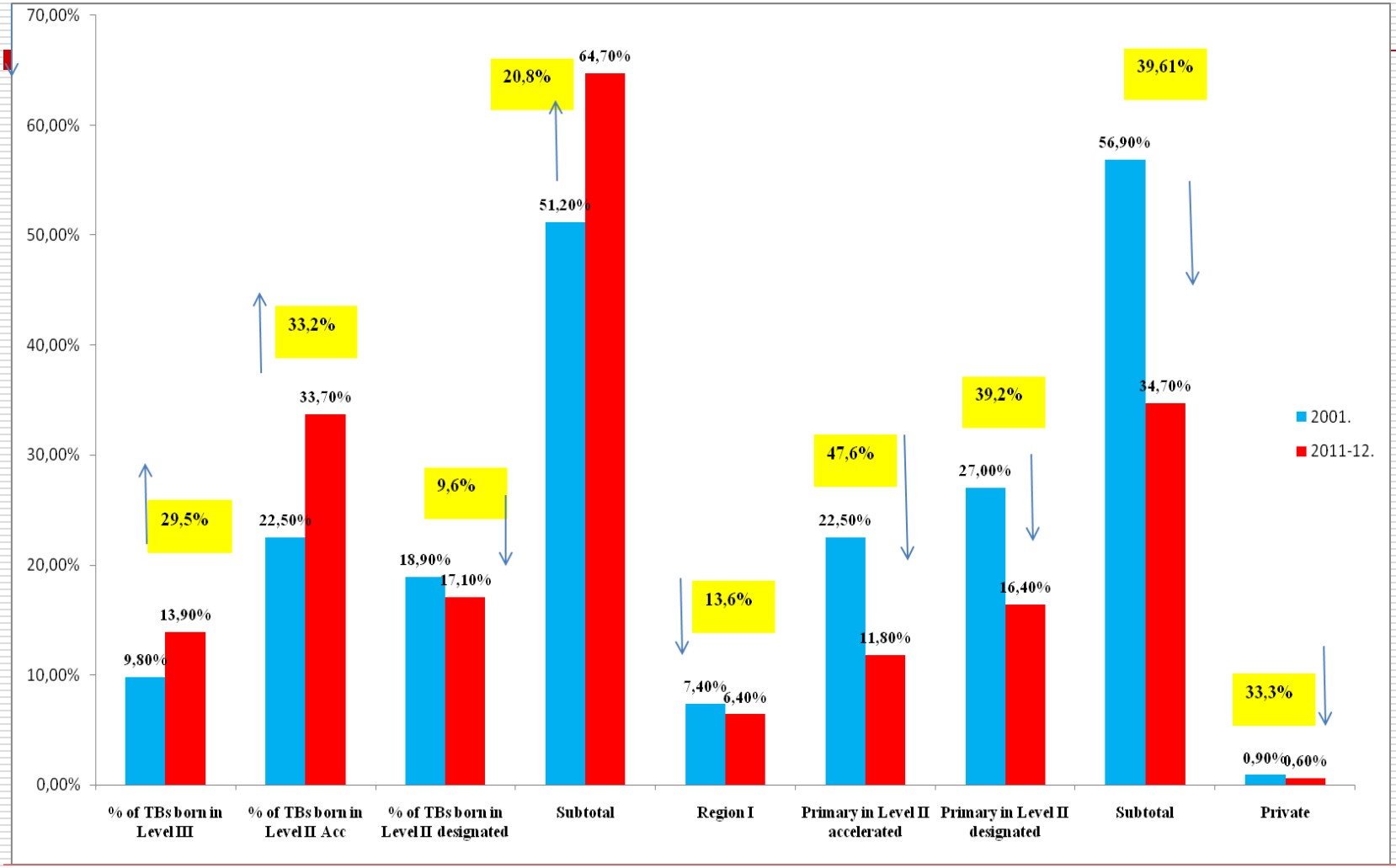
Regionalized Perinatal Service

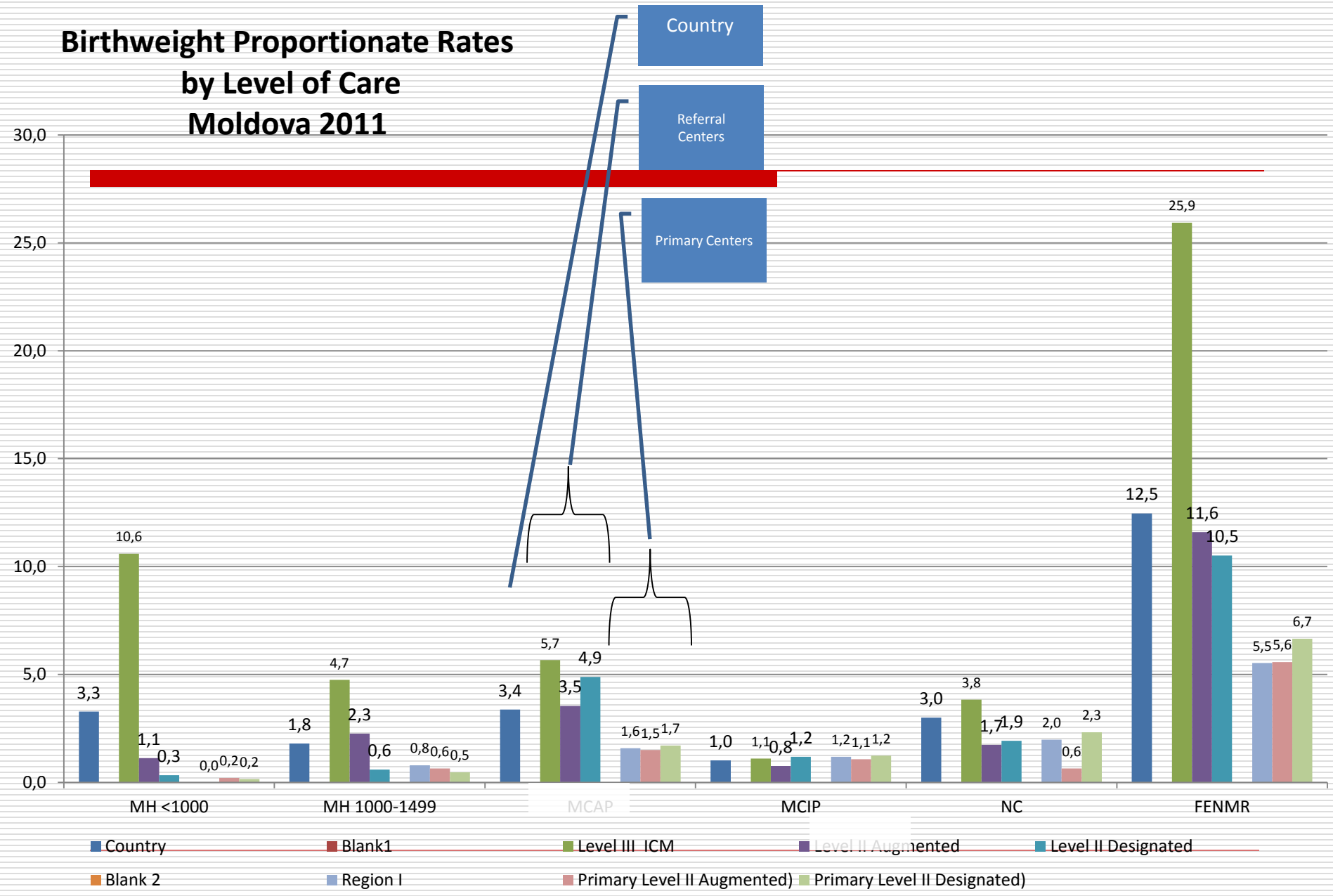
Trend in births per level of care (2001 vs 2014 data)



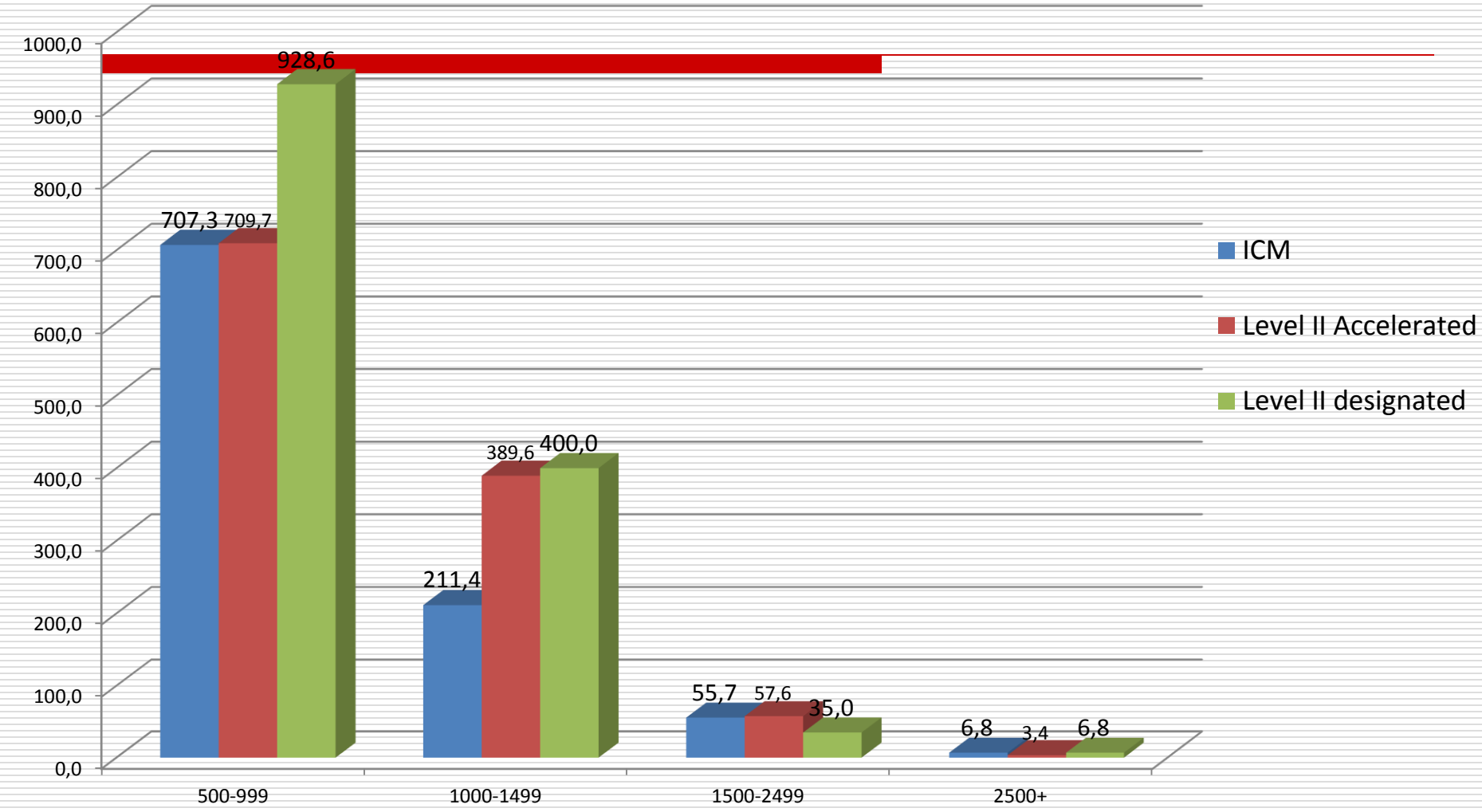


Where are births occurring?
2001-02 vs 2011-12




Birthweight Proportionate Rates by Level of Care Moldova 2011
Country
Referral Centers
Primary Centers
30,0
25,0
20,0
15,0
10,0
5,0
0,0
3,3
10,6
1,1
0,3
0,0
0,2
0,2
1,8
4,7
2,3
0,6
0,8
0,6
0,5
3,4
5,7
3,5
4,9
1,6
1,5
1,7
1,0
1,1
0,8
1,2
1,2
1,1
1,2
3,0
3,8
1,7
1,9
2,0
0,6
2,3
12,5
25,9
11,6
10,5
5,5
5,6
6,7
MH <1000
MH 1000-1499
MCAP
MCIP
NC
FENMR
Country
Blank1
Level III ICM
Level II Augmented
Level II Designated
Blank 2
Region I
Primary Level II Augmented)
Primary Level II Designated)

Comparison of Birthweight Specific Mortality Rates by level of Care, Moldova, 2011



Perinatal Medicine 2015
The "Perinatal Medicine" Subgroup of "The Society of Maternal-Fetal Medicine and Perinatology of Turkey"
"South East European Society of Perinatal Medicine"
23 – 25 April 2015, Istanbul, Turkey

How can we define, manage, monitor and evaluate the Regionalized Perinatal System?

Regionalized Perinatal System

Total and Low Birthweight rates, 2001-2012

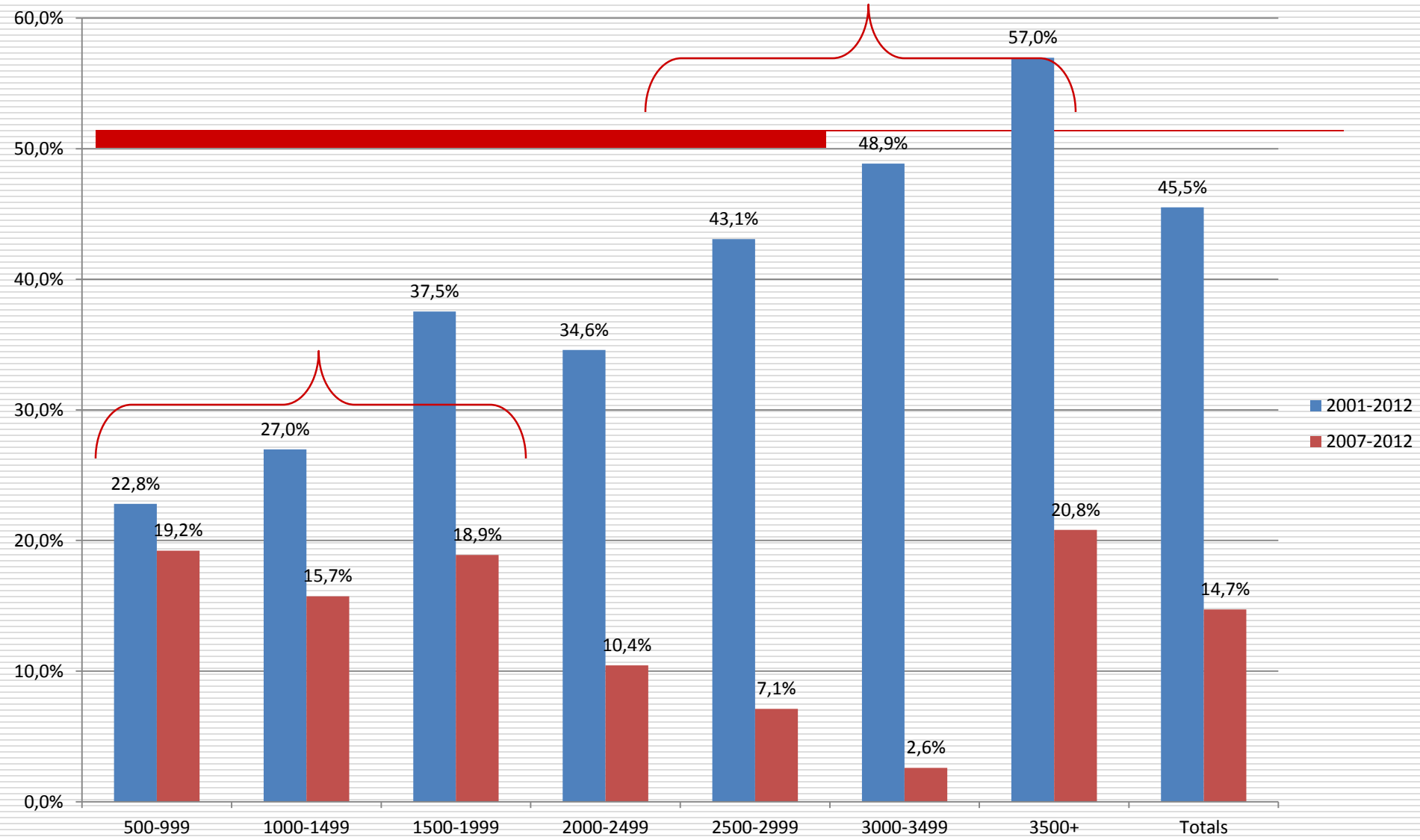
Area	Total Births			Low Birthweight Rates					
				LBWR / LB			LBWR / TB		
	2001	2012	Difference	2001	2012	Difference	2001	2012	Difference
Country	36654	40322	10,0%	5,4	**5,1**	-5,6%	6,1	**5,5**	-9,8%
MCI (Level III)	3597	6045	**68,1%**	7,9	11,4	**44,3%**	9,8	12,1	**23,5%**
Level II Accelerated	8253	13426	62,7%	6,7	5,3	-20,9%	7,6	5,7	-25,0%
Primary in Level II accelerated	4901	4162	-15,1%	3,4	2,1	-38,2%	3,9	2,5	-35,9%
Level II designated	6937	6837	-1,4%	5,5	3,9	-29,1%	6,3	4	-36,5%
Primary in Level II designated	10250	6963	-32,1%	4,6	3,1	-32,6%	4,9	3,3	-32,7%
Private		408		0	0		0	0	
ICM + Region I	6313	8536	35,2%	6,4	8,9	39,1%	7,7	9,5	23,4%
Region I	2716	2491	-8,3%	4,4	3	-31,8%	4,9	3,2	-34,7%
Remaining	33786	31786	-5,9%	5,2	4	-23,1%	5,8	4,4	-24,1%

While the number of TBs in Moldova increased by 10% between 2001-2012, both the LBWR/LB (5,1) and the LBWR/TB (5,5) for the country decreased. For the one Level III hospital the TBs increased by 68%, and its LBWR/TB increased by 44% (from 7.9 to 11.4%, a difference of 3.5%).

The desired increase in the effort to concentrate LBW births in the Level III hospital was successful.

BWSMRs Reduced

Percent Reduction in Birthweight Specific Perinatal Mortality Rates, Moldova, 2001-2012, 2007-12

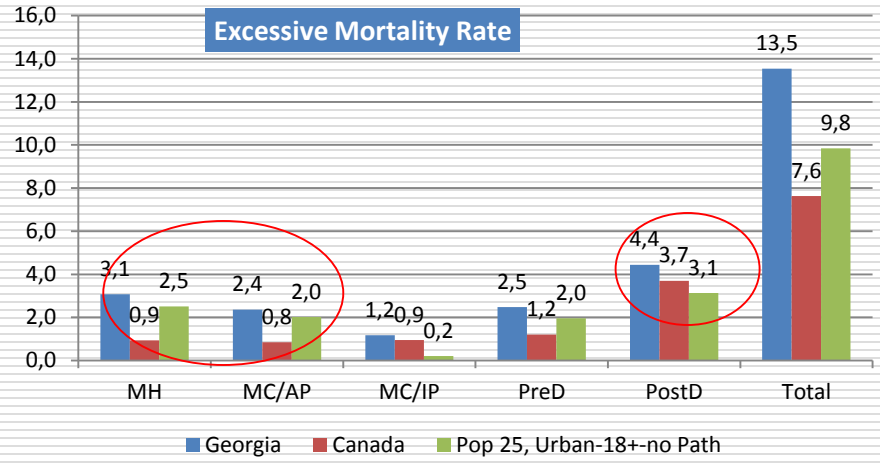


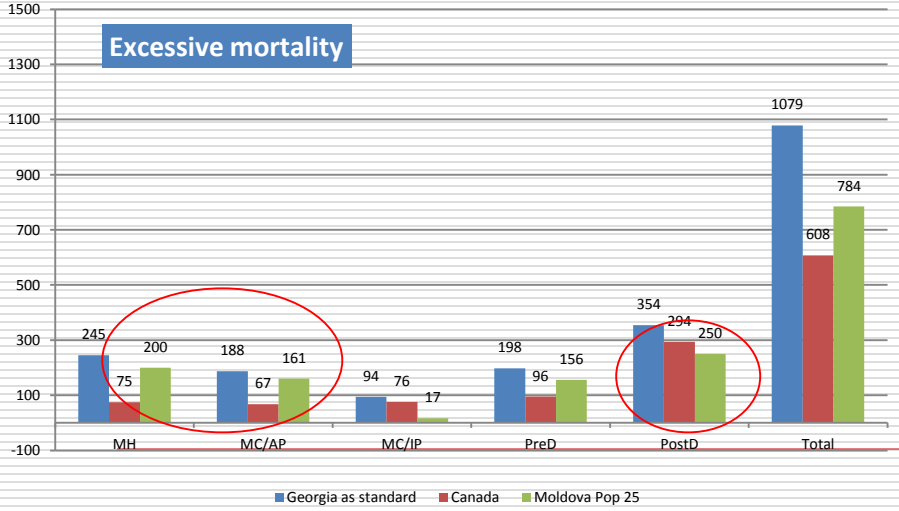
Perinatal Medicine 2015
The "Perinatal Medicine" Subgroup of "The Society of Maternal-Fetal Medicine and Perinatology of Turkey"
"South East European Society of Perinatal Medicine"
23 – 25 April 2015, Istanbul, Turkey

GAP Analysis

Excessive Mortality Rate (EMR)

Comparisons by intervention package,
Moldova, 2011-12





- Excessive mortality rate (EMR) is calculated by subtracting an observed rate from an achieved rate.
- Excessive deaths are calculated by multiplying the EMR by the total number in the population.
- When calculated by EMR for the individual BABIES intervention packages it provides an estimate of the number of deaths that might be prevented by better implementation of a specific intervention package.
- The EMR for Moldova when the Moldovan population of urban, 18 + yrs of age, and no pathology is used 9.8/1000
- The total number of deaths that would be prevented in a 2-years period of time would be 784, with 250 in the Postdischarge package, and 200 in the Maternal health package.

Conclusion

A healthier Moldova, …..
but there is more work to be done.

Why were we successful?

- Vision of regionalization
- Leadership of MoH and senior professionals
- Cooperation and support from key partners
  - SDC, UNICEF, WHO, FIGO, Romanian & Swiss Hospital collaborators.

Ways forward

- To revise the structure of the regionalized system by reducing the number of small maternities e.g. <500 deliveries/year
- To design and implement projects focused specifically on strengthening PHC (MH, MC/AC, PostD)
- To strengthen multiprofessional and multisectorial collaboration
- To maintain at high level already existed QA/QM activities
- To strengthen the role of level II PCs in their refferal area
- To apply internationally acknowledged tools such as QM guidelines, cost studies and training programs.

Thank you for your attention!