Clinical Outcomes of Metabolic Syndrome
- „fates" of respondents of the Project MONIKA SR in 2002-2007

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AIMS: To analyse from official health statistics selected indicators of health status of respondents with different risk profile (detected during the realization of the project in 2002), with emphasis on the respondents with metabolic syndrome (MS).

MATERIALS AND METHODS: Out of 6 847 respondents (aged 15–64 years of six model districts of Slovak Republic) 5 306 persons were identified for analysis.Hospitalizations of respondents were analysed during 5 years for diseases of the circulatory system (DCS) (ICD–10 codes I00–I99), malignant tumors (MT) and/or diabetes mellitus (DM) according to their different risk profile.
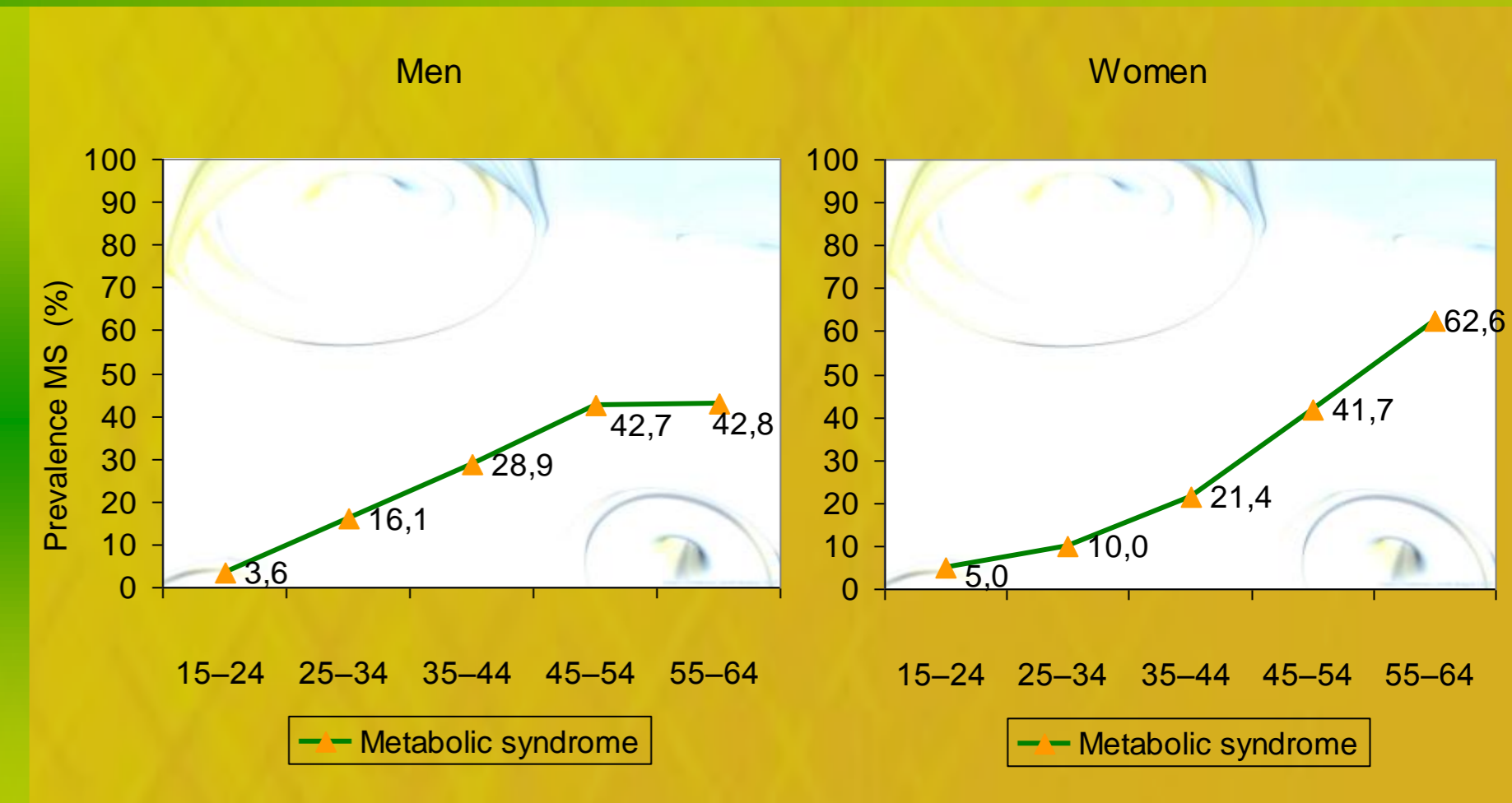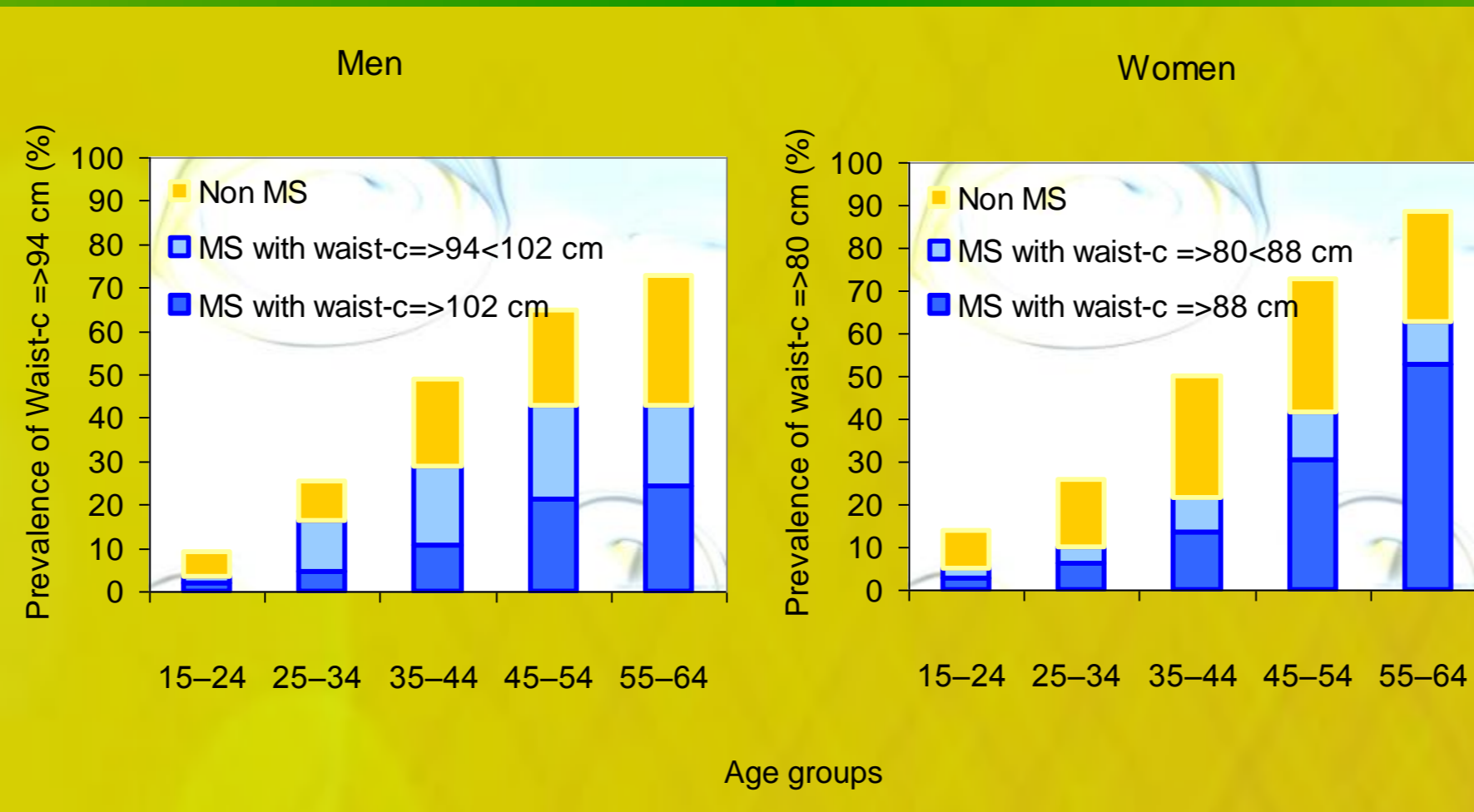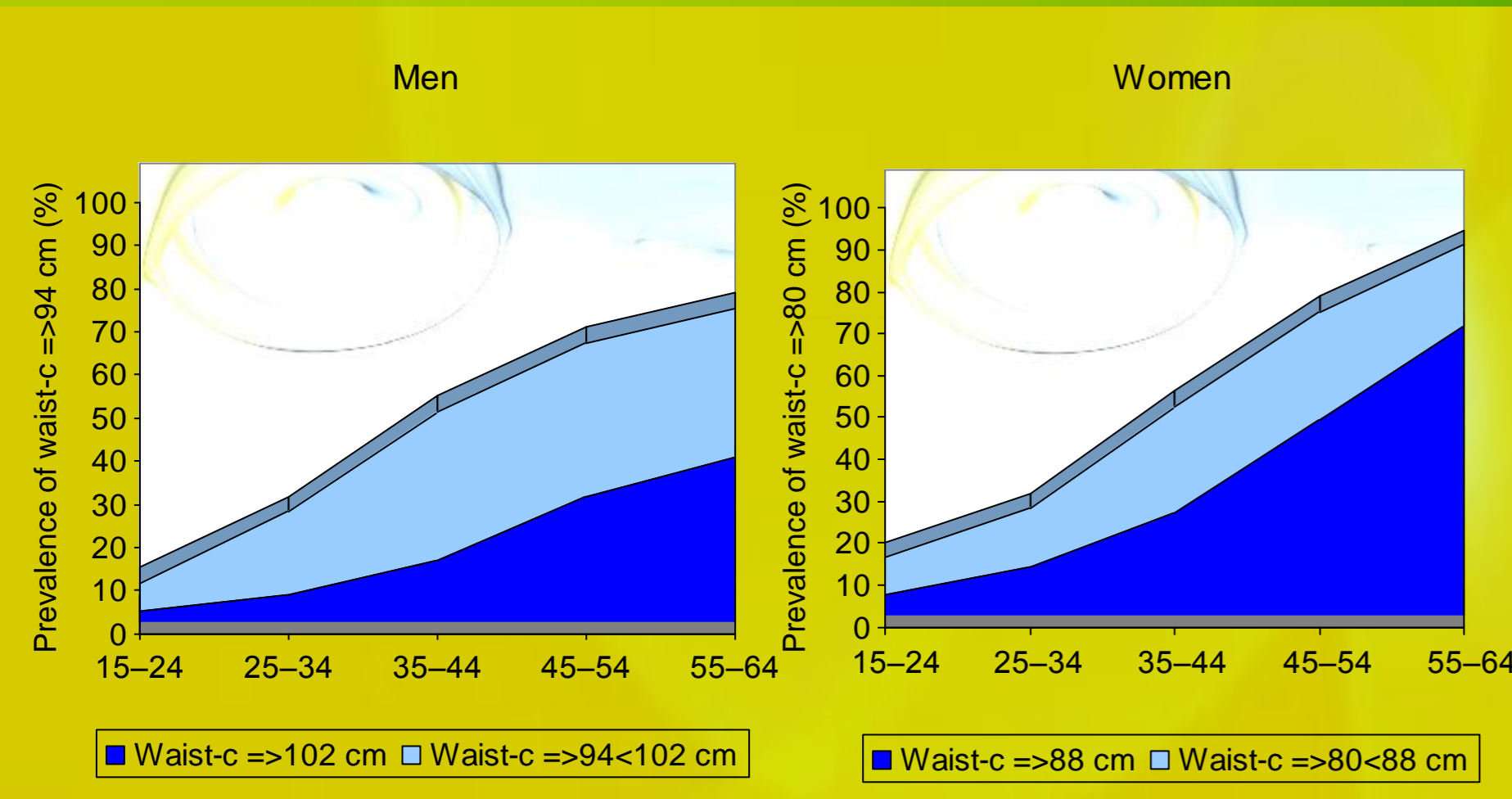
Criteria	Group 1	Group 2		Group 3	
		A	B	A	B
Waist-c=>80/94 cm (women / men)	+	-	+	-	+
Waist-c< 80_w / 94_m cm	-	+	-	+	-
BP => 130 and /or 85 Torr	+	+	+	-	-
HDL < $1,29_w$ / $1,04_m$ mmol/l	+	±	-	±	±*
TAG => 1,7 mmol/l	+	±	-	±	±*
Sign	**MS**	**2A**	**2B**	**3A**	**3B**

* + HDL or TAG

The criteria of IDF (2005) were used for MS (without glycemia, which was examined only in 1 district). Distribution of respondents to 3 basic groups according to blood pressure (BP) and waist circumference (waist-c) presents appurtenant table.
Data analyzed in this presentation relate to respondents without personaly history of diabetes in 2002
Statistical criteria used: *risk ratio* of unfavourable risk profile 15 – 64 year group of respondents from randomized survey in 2002 (calculated on Slovak population).

Risk waist circumference in population of SR

Men / Women

Metabolic syndrome in population of SR with risk waist circumference

Men / Women

Metabolic syndrome in population of SR

Men / Women

RESULTS

Table 1 — Proportion of respondents hospitalized for DCS

Gender	MS	2		3	
		2A	**2B**	**3A**	**3B**
Men	every 9th ♂ (of 722)	14th ♂ (of 302)	6th ♂ (of 168)	36th ♂ (of 831)	13th ♂ (of 169)
Women	every 13th ♀ (of 944)	15th ♀ (of 136)	8th ♀ (of 120)	50th ♀ (of 1214)	29th ♀ (of 503)

Proportion of respondents hospitalized for diseases of the circulatory system (DCS)

For DCS were hospitalized:
- in group with MS every 9th man and 13th woman
- in group 3A every 36th man and 50th woman
- in group 3B even every 13th man and 29th woman

Respondents of group 2B were hospitalized more frequently then with MS (because of the higher proportion of non-treated hypertension?; see graph 2b). **Table 1** presents more detailed data.

Statistical evaluation of hospitalized respondents MS group versus 3A group

Statistically significant (p< 0,005) *difference* between the MS group and 3A was in disadvantage in MS by the hospitalized for:
- DCS for both men and women (RR – 4,1)
- MT only for men (RR – 2,4).

On the border of statistical significance (p = 0,006), despite of RR – 4,3, was the difference recorded in the hospitalization for new DM in disadvantage of women with MS in comparison to 3A group (**table 2**).

Hypertension- dominant risk factor in respondents hospitalized for DCS
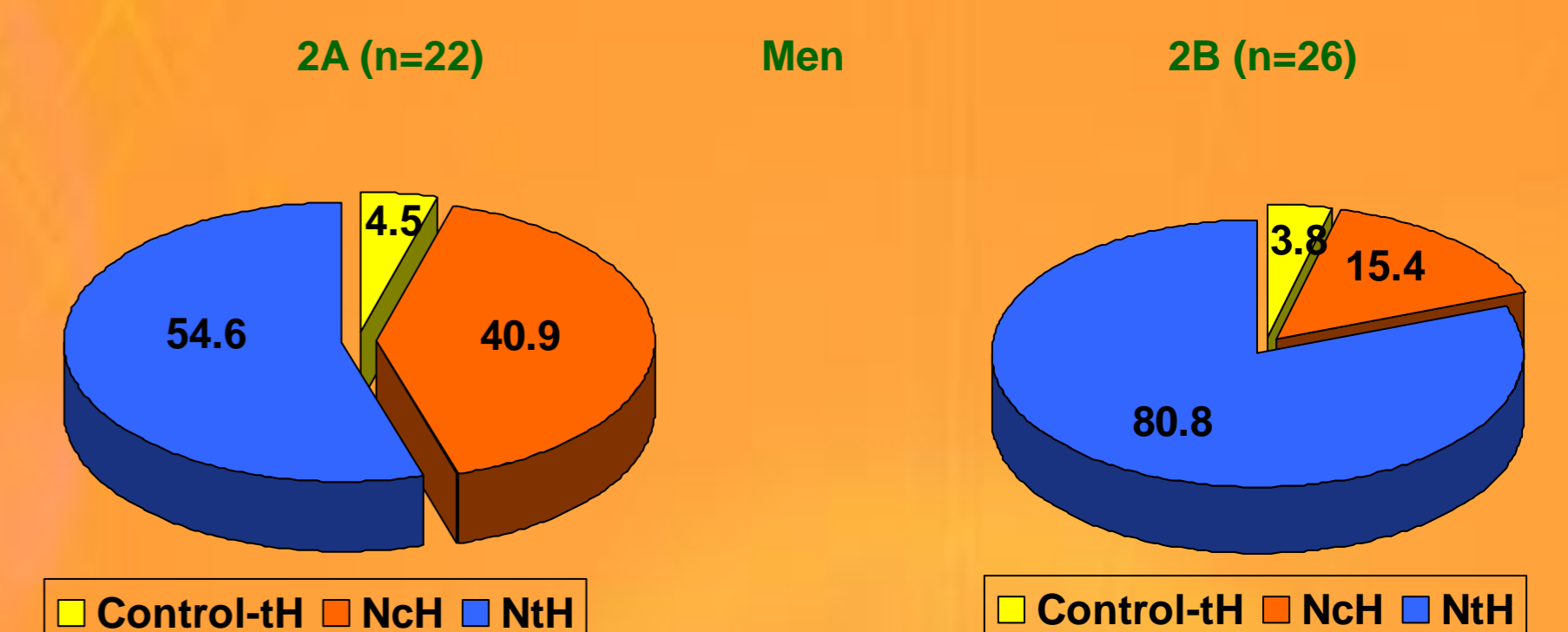
High proportion of non-controlled hypertension (NcH) and non-treated hypertension (NtH) with BP≥140/90 Torr was in all groups, except group 3A and 3B (with BP<140 / 90):
- in group with MS – NcH: men – 38 %, women– 48 %, NtH: 40 % for both gender
- in group 2B – NcH: men – 15,4 %, women – 33,3 %, NtH: men – 80,8 %, women – 66,7 %
- in group 2A – men: NcH – 40,9 %, NtH – 54,6 %, women: NcH and NtH were as in women from group 2B (**graphs 1a,b -2a,b**).
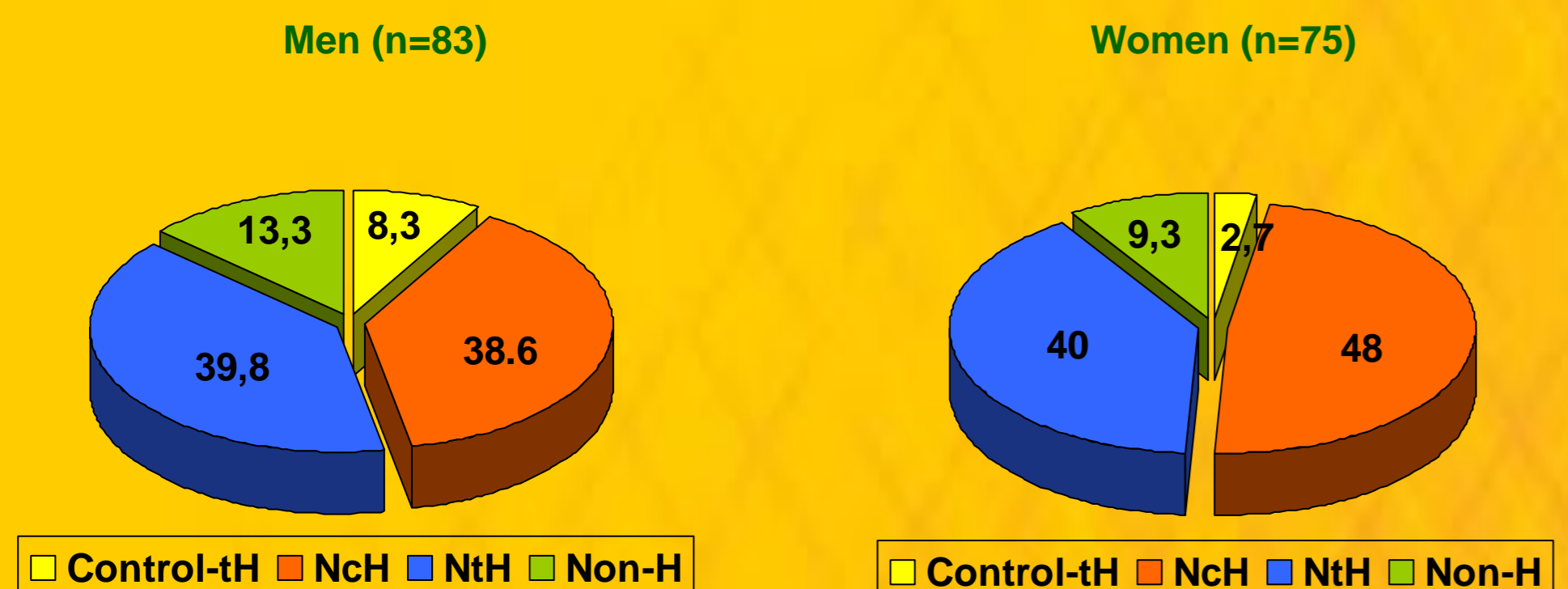
The oldest respondents were with MS (75 % have been older than 50 years and more in both gender).

Cumulative hospitalization time for DCS
was the longest in group with MS, particularly in group MS_2 (waist-c ≥ 88 cm_w /102 cm $_m$). Greater disadvantage had group 2A and 2B in comparison with group 3A and 3B only in men (**graphs 3a,b**).
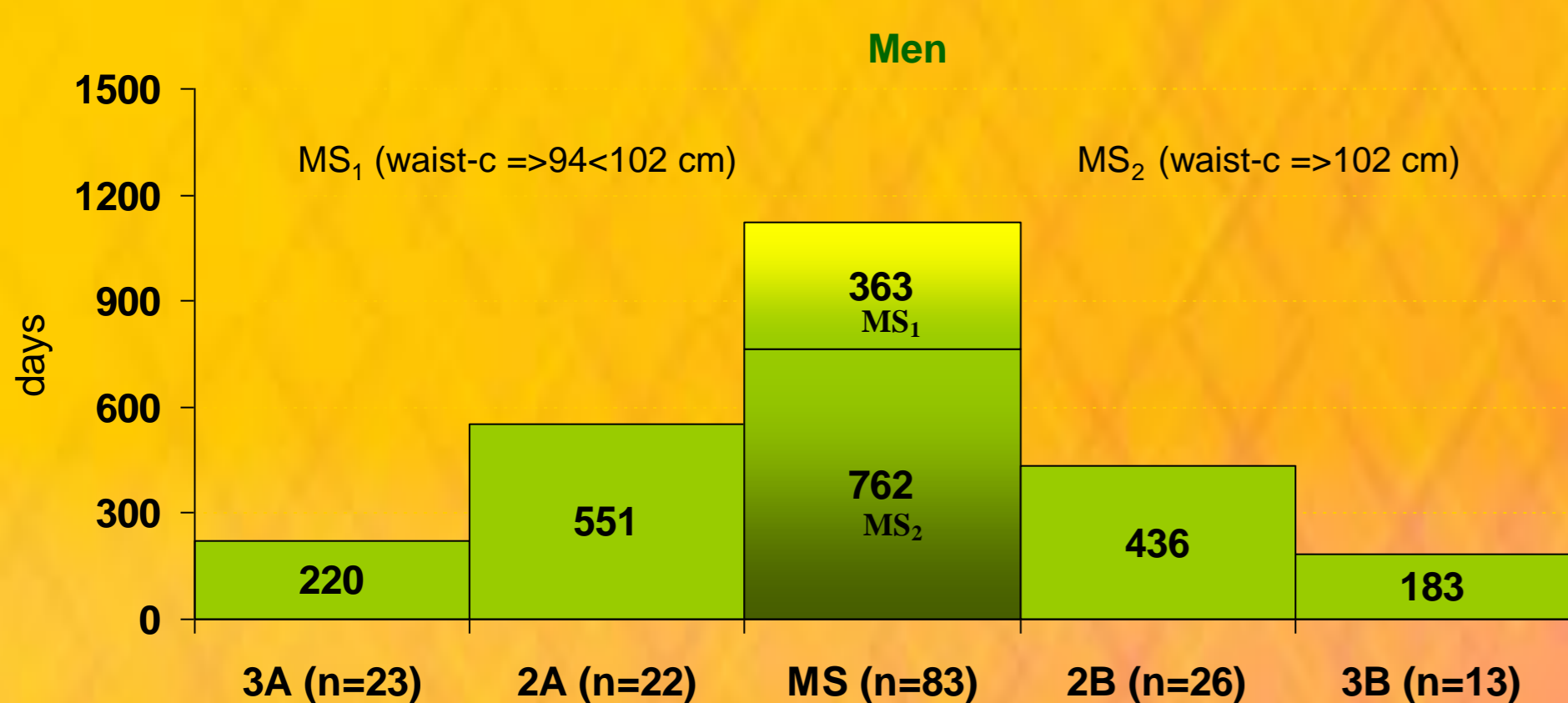
Table 2 — Statistical evaluation - comparison MS with group 3A

Group	Gender	DCS		MT		DM	
		RR	p<0,005	RR	p<0,005	RR	p<0,005
MS/3A	Men	4,1	+	2,4	+	1,1	-
	Women	4,1	+	1	-	4,3	p=0,006

Graph 1a Dominant risk factor in respondents hospitalized for DCS (%) **Graph 1b**

Men (n=83): 13,3 / 8,3 / 39,8 / 38.6
Women (n=75): 9,3 / 2,7 / 40 / 48
☐ Control-tH ☐ NcH ☐ NtH ☐ Non-H

Graph 2a Dominant risk factor in respondents hospitalized for DCS (%) **Graph 2b**

2A (n=22): 4.5 / 54.6 / 40.9
Men
2B (n=26): 3.8 / 15.4 / 80.8
☐ Control-tH ☐ NcH ☐ NtH

Graph 3a Cumulative hospitalization time for DCS

Men
MS_1 (waist-c =>94<102 cm) MS_2 (waist-c =>102 cm)

3A (n=23)	2A (n=22)	MS (n=83)	2B (n=26)	3B (n=13)
220	551	363 MS_1 / 762 MS_2	436	183

days

Graph 3b Cumulative hospitalization time for DCS according groups

Women
MS_1 (waist-c =>80<88 cm) MS_2 (waist-c =>88 cm)

3A (n=24)	2A (n=9)	MS (n=75)	2B (n=15)	3B (n=17)
190	139	165 MS_1 / 1099 MS_2	142	182

days
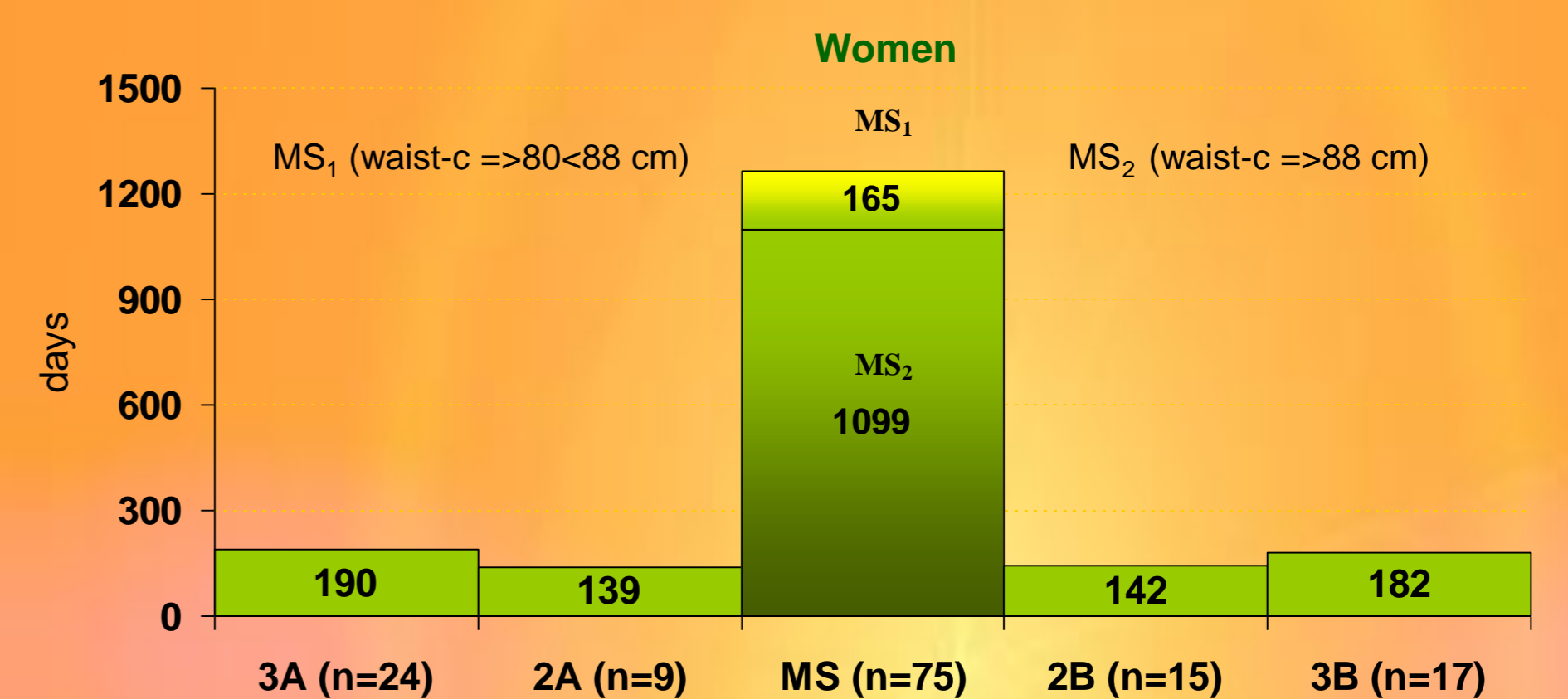
Graph 4 Standardized incidence of selected acute DCS in population of SR in 1996 – 2006

◆ men/ stroke (I60–I64) ◇ women/stroke (I60–I64)
▲ men/acute coronary syndrome (I20–I22) △ women/acute coronary syndrome (I20–I22)

CONCLUSIONS:

The growing prevalence rates of risk waist-circumference, non-treated hypertension, metabolic syndrome and diabetes mellitus 2.type in population of SR represent not only an important health, but also economical problem. This might be a reason why incidence rates of dominant acute DCS and mortality rates of DCS are rather stagnating, resp.is not decreasing in Slovakia (in contrary to the other developed countries in Europe (graphs 4,5). The actual health status of the population in Slovakia is the main challenge to establish new national intervention programs, emphasizing particularly the need of systematic education of population.

Graph 5 Standardized mortality for DCS in 1981- 2005

Deaths/ 100 000 inhab., eur.standard
◇ Austria
▲ Czech Republic
┼ Finland
△ France
◇ Hungary
○ Poland
■ Slovakia
△ Ukraine
● EU (15) before may 2004

Years

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