Evaluation of ergonomic professional equipment in hairdressing salons

- How did the movement start
- Role played by the social partners
- Involvement of suppliers of equipment
- Adoption of standards
- Technical solutions for hairdressing salons
- Hairdryers
- Scissors
- Seating
- Wash basins
- Conclusion

How did this movement start?

- AG2R La mondiale commissioned several studies
- CNAM statistics
- RSI Prévention Pro programme

CNAM statistics

Main occupational diseases : MSD, eczema, respiratory illnesses

Principales maladies professionnelles

Code tableau	Libellé du tableau	Nb MP	%	Nb 2015
057A	Affections périarticulaires	512	83%	488
065A	eczéma allergique	67	11%	70
066A	Aff. Respir./ allergie	26	4%	27
015B	allergique/amines hydroxylés	11	2%	11
084A	Aff./solvants orga.liquides	2	0%	1
	Autres MP	2	0%	8

Accidents du travail   Work-related injuries

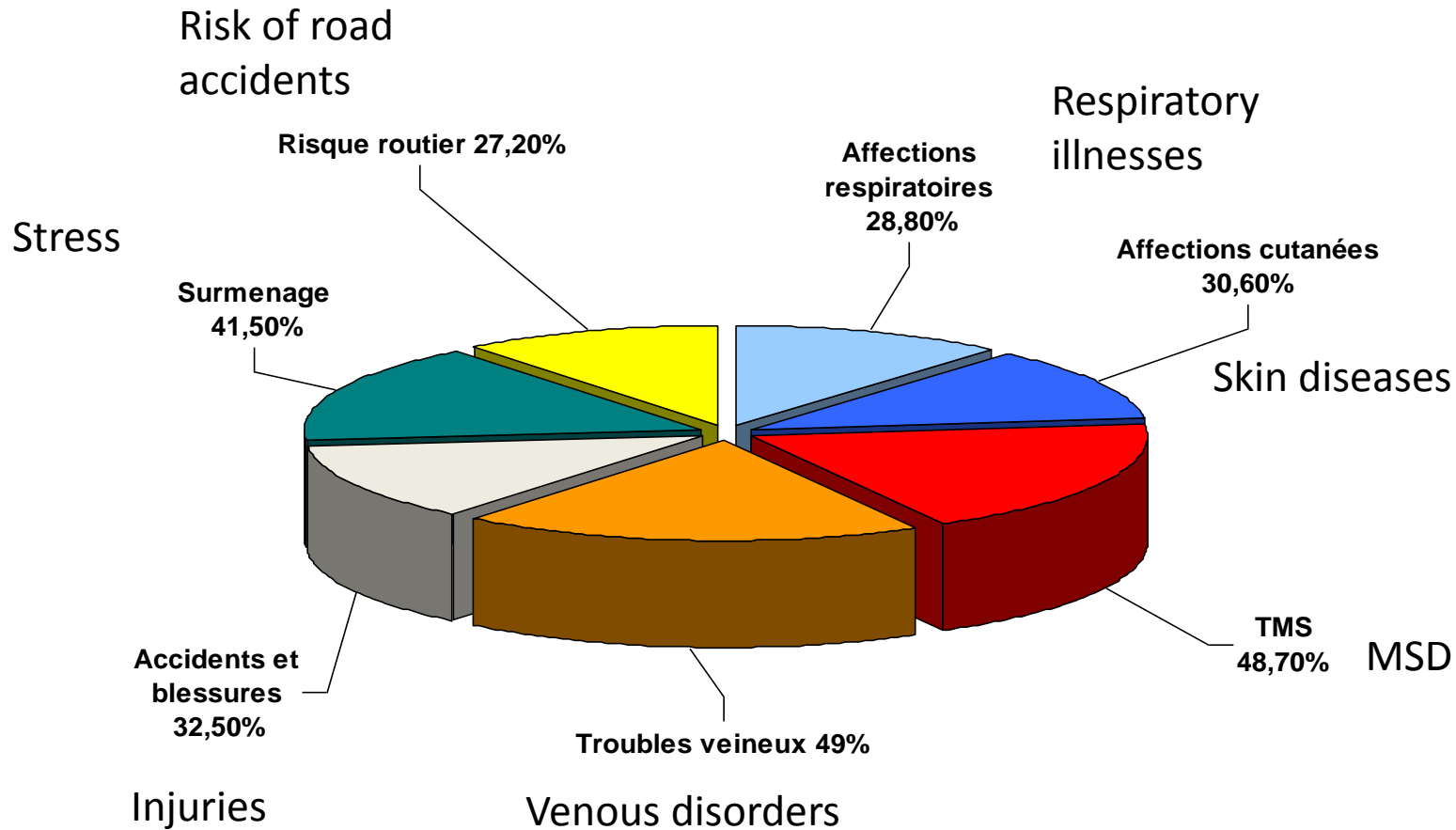Evolution du nombre et de la fréquence des accidents de travail

Nb
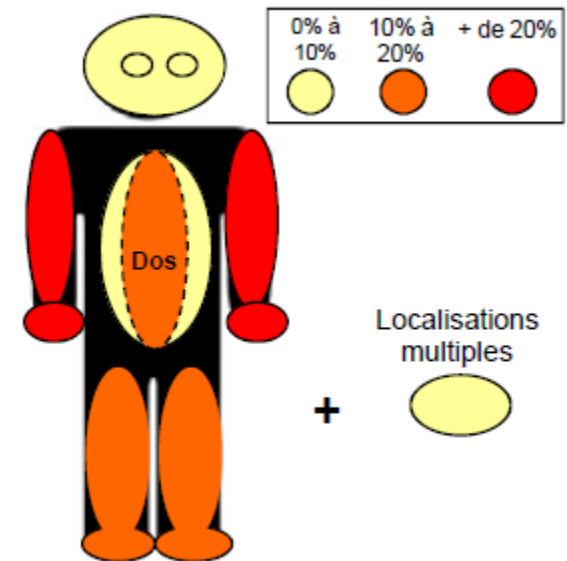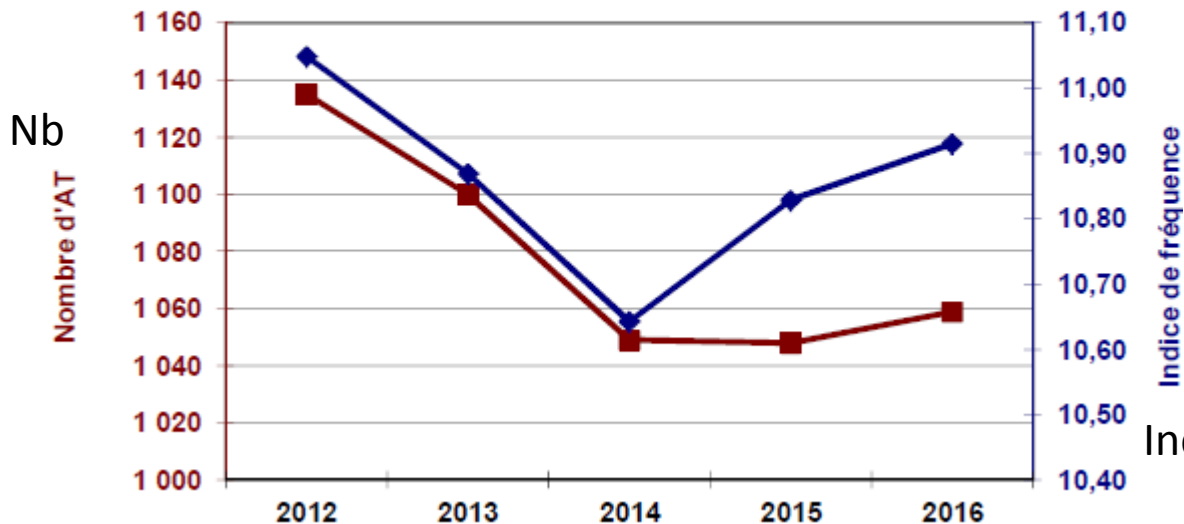
Incidence rate

RSI Prévention Pro Programme

(medical follow-up and and recommendations for prevention)

Hairdressers 2012

Based on 4,641 hairdressers

Role played by the social partners

- In 2013, Social Security social partners decided to award a grant of 10 million euros to help hairdressers buy ergonomic equipment.

- Involvement of the suppliers of equipment

In 2013, AG2R La Mondiale and the CNAM brought suppliers of equipment together to explain that a grant could be awarded to hairdressers who purchased equipment that meets ergonomic standards and that is certified by an inspection body and approved by the CNAM.

This represented a good opportunity for them to produce this type of equipment, which would then be listed on an official website.

- Adoption of standards

We systematically use international or European standards the aim of which is to ensure that equipment from any country of the world is suitable for use.

This provided us with a common language in which we could communicate with suppliers and inspection bodies.

Référentiel technique connu, accessible aux fabricants: **norme NF EN ISO 14738**

Certification par un organisme indépendant

Déclaration CE de conformité

Conformité aux directives

⇒ Machines 2006/42/CE
⇒ Basse tension 2006/95/CE
⇒ Compatibilité électromagnétique 2004/108/CE

Ci sono robuste evidenze scientifiche degli effetti negativi associati a condizioni nelle quali le articolazioni degli arti superiori sono impegnate in **aree superiori al 50% della loro massima escursione angolare (ISO 11228-3),** per percentuali significative del tempo di lavoro. Si riportano di seguito i parametri valutati per la spalla:

Per quel che concerne il **rachide lombare**, invece, diventano a rischio i seguenti movimenti (**ISO 11226**):

- Technical solutions aimed at reducing MSD

- # Hairdryers

We wanted the lightest and quietest hairdryers

We decided on 400 grams for the upper limit

After several trials we noticed that noise level wasn't relevant because the average number of decibels inside hairdressing salons is higher than the number produced by hairdryers.
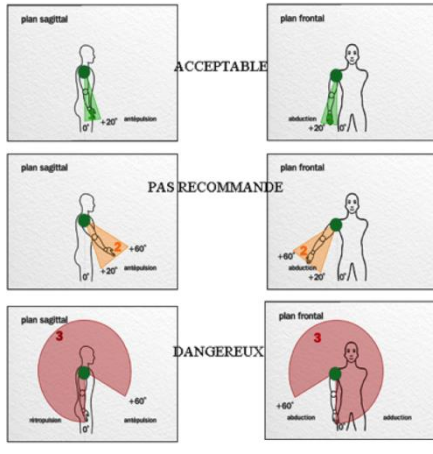So we decided to eliminate this criterion.

- Results of a survey into problems with posture and the type of scissors used to cut hair.
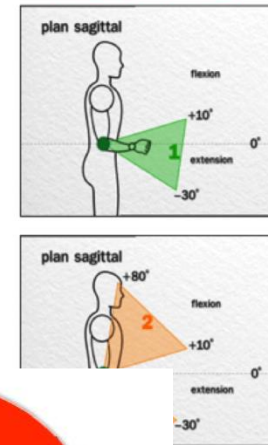
Rapport d'Analyse Posturale Lors d'Utilisation
de Ciseaux de Coiffure

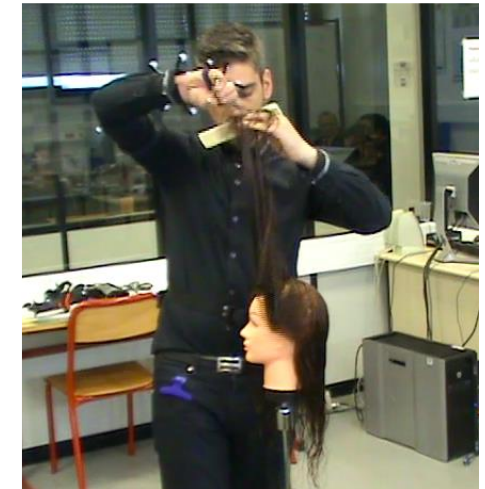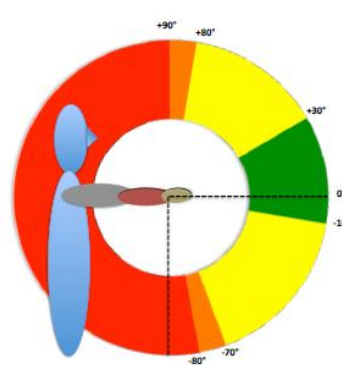Mourad Benoussaad, Jean-Yves Fourquet

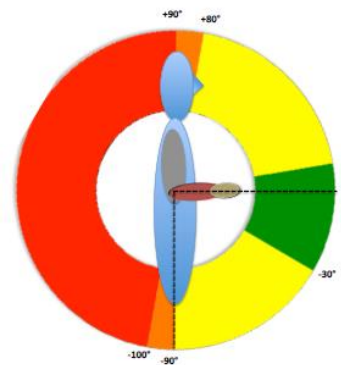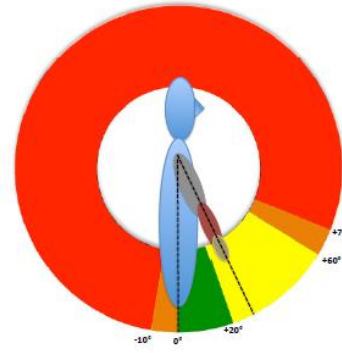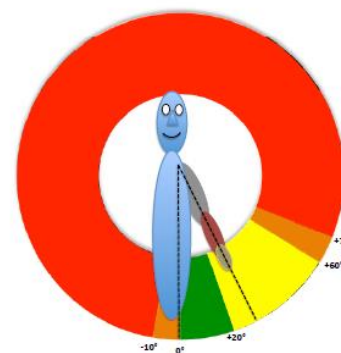7 septembre 2015

shoulders

EPAULE
(bras - tronc)

elbows **COUDE**
(avant-bras - bras)

wrists **POIGNET**
(main - avant-bras)

(a) Epaule : plan frontal
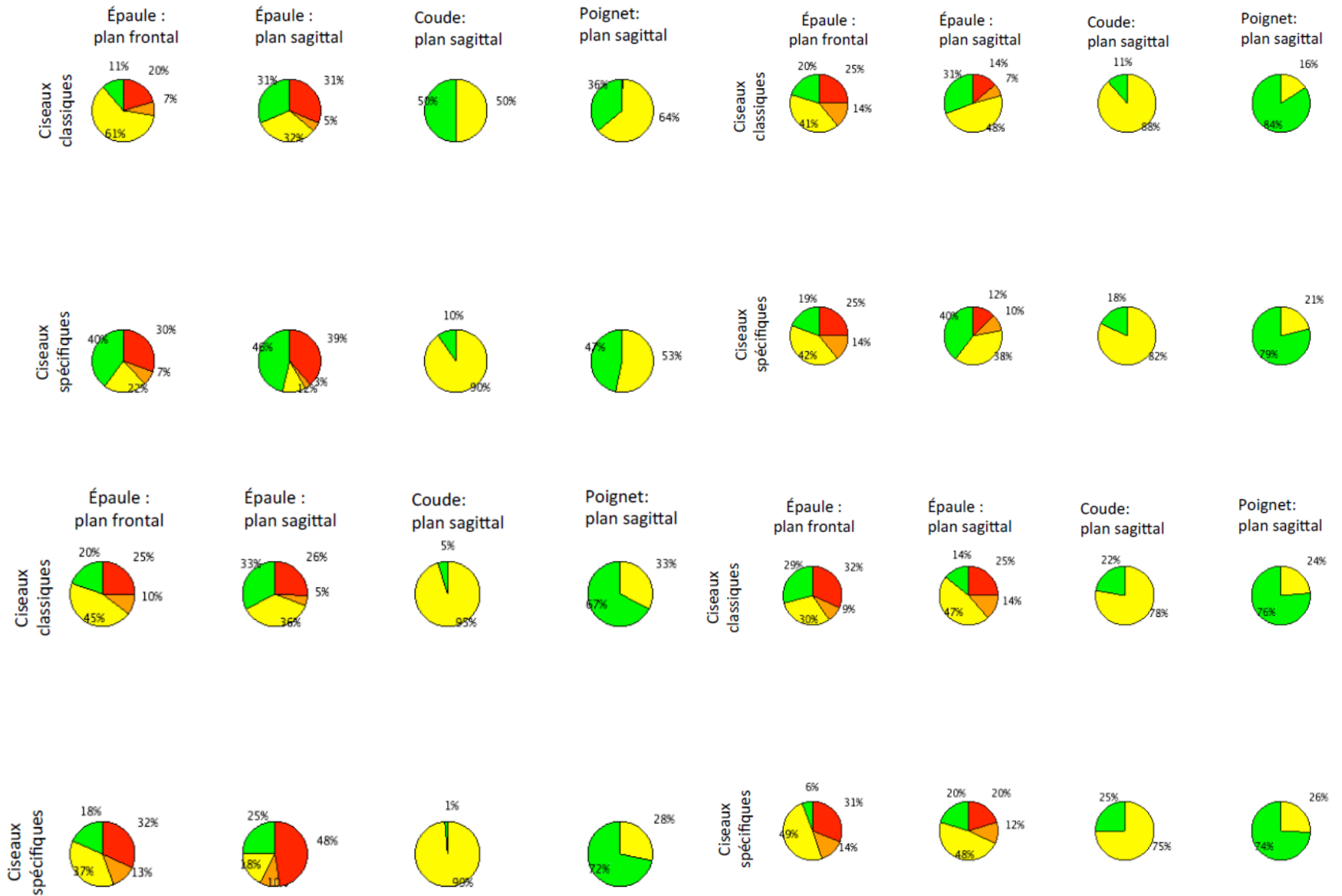
(b) Epaule : plan sagittal

(c) Coude : plan sagittal

(d) Poignet : plan sagittal
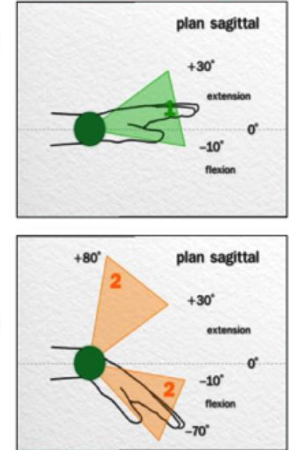
■ Confortable   ■ Acceptable   ■ Inconfortable   ■ Dangeureux

A study based on 5 types of classic scissors vs 5 types of ergonomic scissors

We recorded the angles between each part of arm during a period of around 10 minutes.

Épaule : plan frontal — Ciseaux classiques: 11%, 20%, 7%, 61%

Épaule : plan sagittal — 31%, 31%, 5%, 32%

Coude: plan sagittal — 50%, 50%

Poignet: plan sagittal — 36%, 64%

Classic scissors

Ergonomic scissors

Ciseaux spécifiques:

plan frontal — 40%, 30%, 7%, 22%

plan sagittal — 46%, 39%, 3%, 12%

Coude — 10%, 90%

Poignet — 47%, 53%
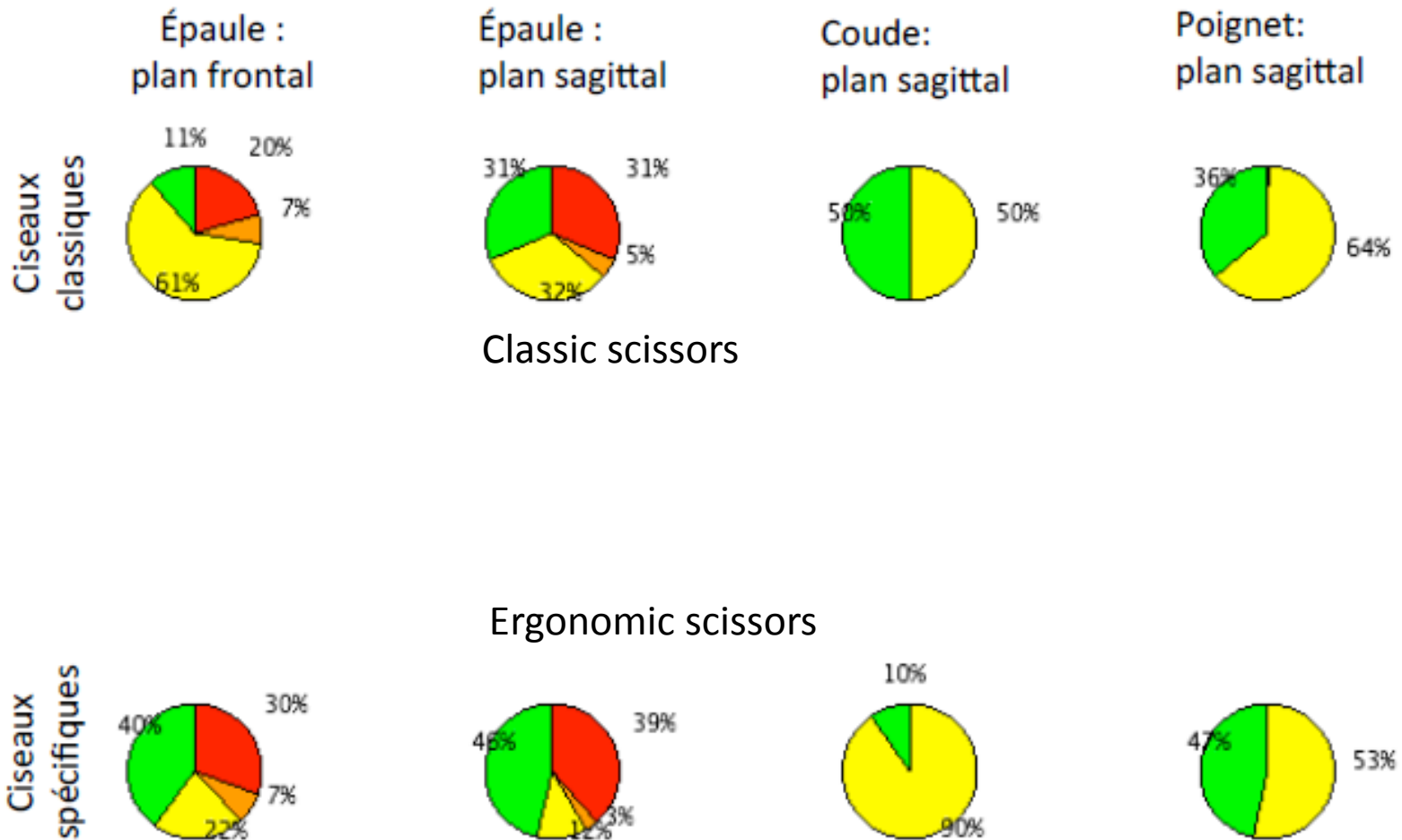
As you can see in this example there are no reductions in the red zones when using ergonomic scissors. So we thought it important to take measurements based on scientific methods in order to prove the improvements that can be achieved by changing equipment.

4 Résultats, conclusions et perpectives

4.1 Qualifications des postures mesurées à l'aide d'OREGE

L'observation et les mesures permettent de relever peu de postures extrêmes. Par contre, un grand nombre des postures se trouve dans la zone dite dangereuse au sens de la norme OREGE. L'utilisation de ciseaux spécifiques ne change pas radicalement cette situation même si on peut observer des transferts de contraintes d'une articulation à l'autre, ou du plan sagittal au plan frontal et les résultats varient peu d'un point de vue statistique. Le détail des diagrammes statistiques obtenu avec les différents participants est fourni à la section suivante. On peut observer statistiquement différents transferts de contrainte d'une articulation à l'autre. Cependant, de manière générale :

> L'utilisation de ciseaux spécifiques ne modifie pas significativement les diagrammes OREGE associés à chaque coupe.

4.2 Analyse de la méthodologie

Le diagramme OREGE ne permet pas de mettre en avant l'avantage potentiel des ciseaux spécifiques à faciliter l'alternance des postures. Compte tenu de la définition de ses seuils plus adaptés à un travail répétitif, la méthode OREGE ne permet pas de discriminer les postures réellement extrêmes de celles qui pourraient présenter un risque faible compte tenu de la variabilité de la tâche. Le poste de travail du coiffeur n'est pas un poste répétitif au sens industriel du terme : OREGE (et RULA) sont certainement trop "sévères" en termes de seuils angulaires.

Les pratiques observées sont d'une grande variabilité et dépendent notamment de la formation des coiffeurs et des autres facteurs techniques : type de coupe (toutes les coupes sont-elles aussi exigeantes ?), réglage en hauteur du support ou du fauteuil, qualité de l'acier, longueur de la lame, hypothèse d'un ciseau universel *versus* combinaison de ciseaux adaptés aux phases de la coupe.

La base d'évaluation, le type de coupe, devraient pouvoir être précisées a priori : spécification de la coupe demandée, validation du travail réél *versus* travail prescrit, contraintes temporelles, ... afin de pouvoir reproduire des conditions réalistes reproduisant l'exigence de performance professionnelle instantanée (temps, fini de la coupe).

4.3 Perspectives

Si l'objectif de qualifier ergonomiquement des ciseaux à prise en main spécifique ou/et comportant des degrés de liberté supplémentaires demeure, en faisant abstraction des autres déterminants de la posture, il pourrait notamment être utile de :

- de préciser les types d'atteinte musculo-squelettique a priori concernés par l'étude et d'évaluer la corrélation avec la posture ou d'autres facteurs tels que l'effort,
- de définir une ou plusieurs coupes avec un cahier des charges strict (temps, phases, qualité de finition) en s'appuyant sur des professionnels indépendants (professeur de coiffure, et professionnels en salon) prescripteurs,
- de faire réaliser ces coupes par un échantillon témoin, incluant les prescripteurs, à l'aide de ciseaux classiques,
- de faire réaliser ces coupes par les coiffeurs des distributeurs à l'aide des ciseaux spécifiques.
- d'identifier les risques inhérents aux phases de coiffage.

The use of specific scissors do not change meaningfully the Orege diagrams asociated with each hair cut

The method could not be relevant beacause the job is not an industrial one

Heardresser training
Height seat adjustement
Quality of steel
One or more scissors for the job

FINAL REPORT

Static and dynamic evaluation of the biomechanical overload joined to different height adjustments of the armchair seat "LIONESS 3365"
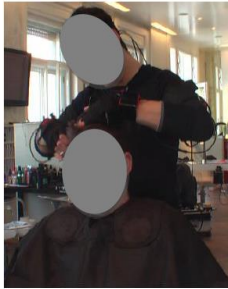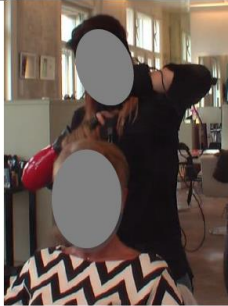
PRELIMINARY REPORT

Valutazione statica e dinamica del sovraccarico associato a diverse quote di regolazione del piano di seduta della poltrona "Musette 300"
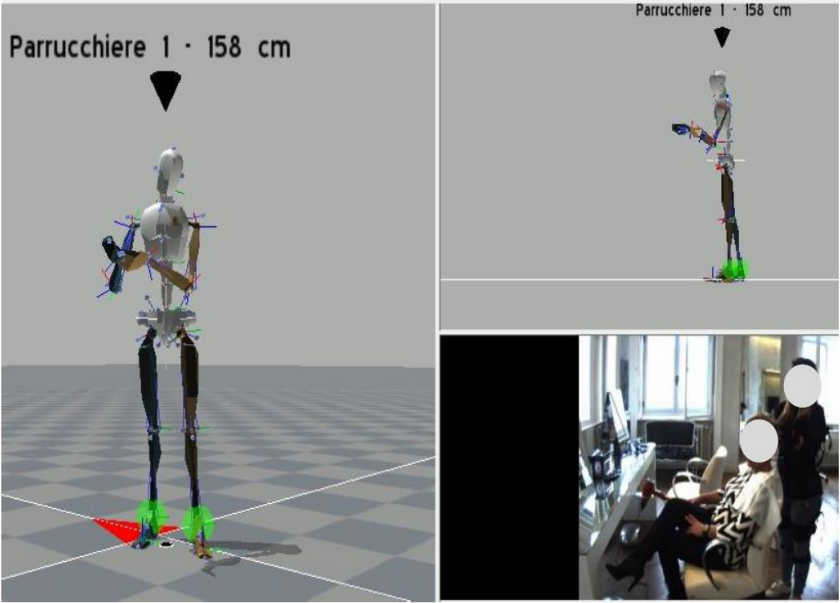
Supervisore Scientifico:
Prof. Francesco Marcolin
(Ergonomo Europeo Certificato)
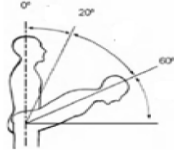
Spin-Off Accademico dell'Università di Udine
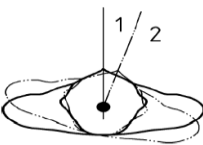
TASK		FOTO
1	Taglio	
2	Colore	
3	Meches	
4	Piega	

Ci sono robuste evidenze scientifiche degli effetti negativi associati a condizioni nelle quali le articolazioni degli arti superiori sono impegnate in **aree superiori al 50% della loro massima escursione angolare (ISO 11228-3),** per percentuali significative del tempo di lavoro. Si riportano di seguito i parametri valutati per la spalla:

Per quel che concerne il **rachide lombare**, invece, diventano a rischio i seguenti movimenti **(ISO 11226):**

Rachide lombare	Flessioni non supportate superiori a 20°, se ripetute più di 2 vv/minuto, e flessioni superiori a 60°	
	Bending laterali superiori a 10-15°	
	Rotazioni assiale superiore a 30°	

ESEMPIO BENDING LATERALE

Neck - Lateral bending

LIMITS, Acceptable zone
Awkward postures (> 15°): 8.4%
Awkward postures (< -15°): 2.0%

LIMITS, Recommended zone
Awkward postures (> 10°): 19.0%
Awkward postures (< -10°): 6.6%

Shoulder - Flexion-Extension

LIMITS, ISO 11228-3
Awkward postures left : 17.6%
Awkward postures right: 4.5%

LIMITS, ERGOCERT REDUCED
Awkward postures left : 72.3%
Awkward postures right: 32.5%

| Utente	Sesso	Altezza	Task	Quota	Flessioni superiori ad 80° ed estensioni superiori a 20°		Abduzioni superiori a 45°	
					Arto sx	Arto dx	Arto sx	Arto dx
Parrucchiere 1	F	158 cm	Colore	46,5 cm	4%	2%	ASSENTI	18%
			Meches	46,5 cm	1%	ASSENTI	ASSENTI	15%
			Taglio	46,5 cm	18%	5%	ASSENTI	23%
				52 cm	25%	2%	ASSENTI	4%
				55 cm	54%	2%	ASSENTI	41%
			Piega	46,5 cm	10%	4%	ASSENTI	30%
Parrucchiere 2	M	180 cm	Colore	46,5 cm	4%	4%	2%	1%
				54 cm	1%	1%	3%	2%
			Taglio	46,5 cm	ASSENTI	1%	ASSENTI	ASSENTI
				54 cm	ASSENTI	2%	ASSENTI	ASSENTI
				56 cm	ASSENTI	ASSENTI	ASSENTI	ASSENTI
				59 cm	2%	ASSENTI	ASSENTI	ASSENTI
				62 cm	ASSENTI	ASSENTI	ASSENTI	ASSENTI
			Piega/Phon	59 cm	ASSENTI	1%	ASSENTI	ASSENTI

Arti superiori (spalla) %tempo di rilevazione
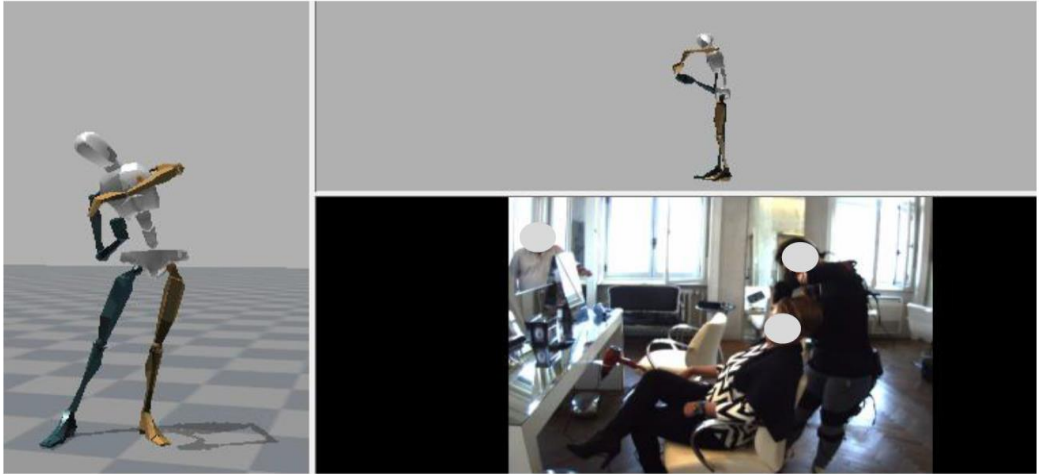
Evaluative Survey TMS Preciseo

- GOAL
  → Measure the impact of the electric shampoo tray on MSD = Look for clinical signs of MSD Before and After use of the tray (+6 months)

- METHOD
  → If before and after populations are statistically comparable and if "all things are equal" then it is possible to look for a causal link

  → Nordic MSD questionnaire: existence, location and intensity of osteo-articular discomfort / pain
  → Remote interrogation
    - by telephone
    - by a nurse
    - by hairdressing (files transmitted by the CRAM)

  → Categorisation by level of clinical impairment and location

- RESULTS
- DISCUSSION / CONCLUSION

Extract of the call script

During the past 12 months, have you experienced any discomfort (pain, discomfort, numbness, body aches) in the following areas of the body?

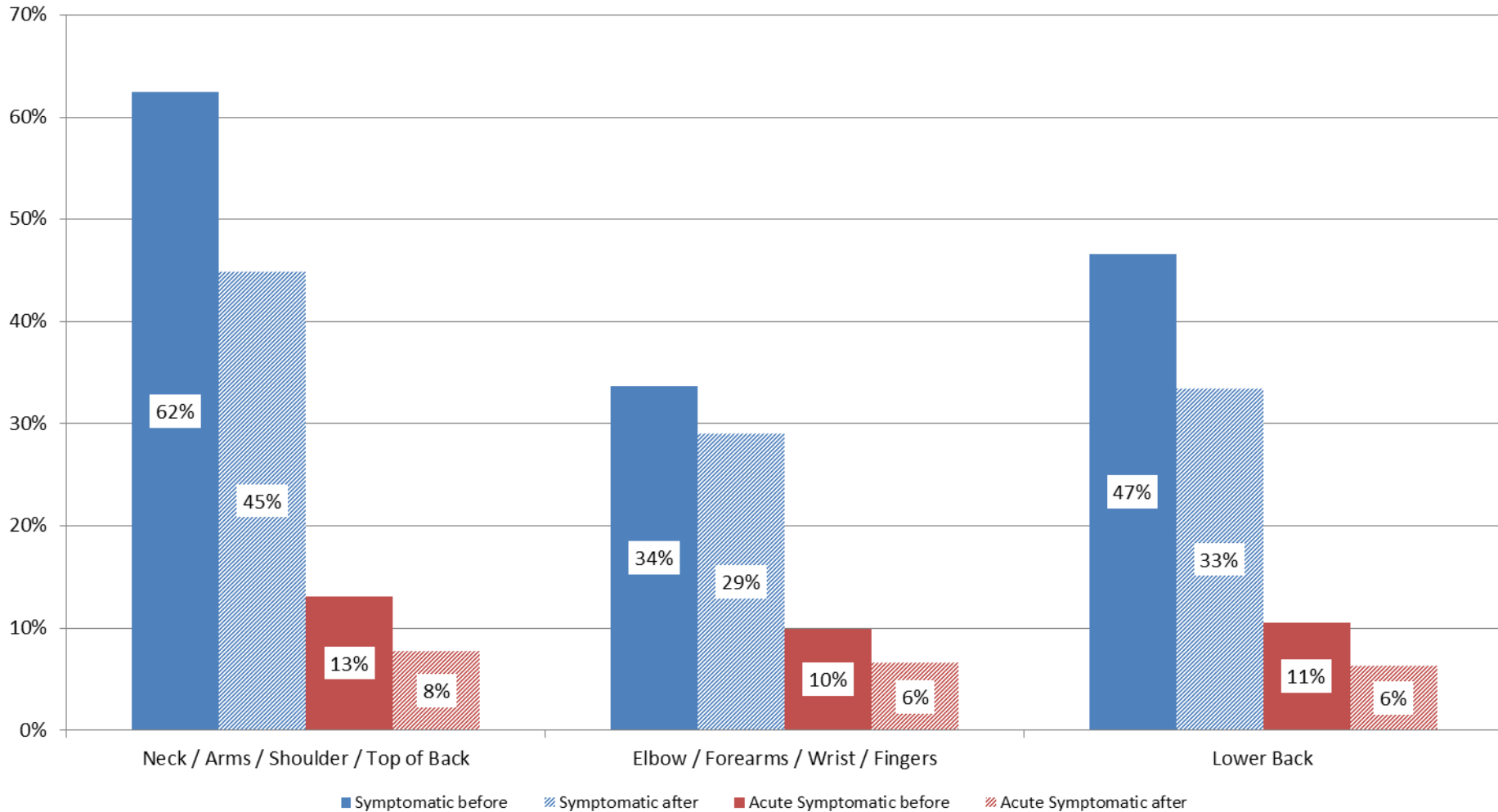|	YES / NO	If yes: drop-down menu side: RIGHT / LEFT / THE 2	If yes: drop-down menu intensity of pain: 0 to 10	If yes: drop-down menu "how often?":
NECK			Knowing that 0 = neither discomfort nor pain	Almost never (every 6 months)
SHOULDER S / ARMS			And 10 = intolerable discomfort or pain	Rarely (every 2/3 months)
ELBOWS / FOREARMS				Sometimes (every month)
HANDS/ WRISTS				Sometimes (every month)
FINGERS				Almost all the time (every day)
UPPER BACK				
LOWER BACK				

Symptomatic = experienced pain or discomfort at least once in the last 12 months
Acute Symptomatic = felt pain > 7 every day

Results

Total number of respondents: Before 1139 / After 836
Populations are comparable in terms of seniority and location
The differences observed are statistically significant p <0.05

Distribution of% of cases by zone (compared to the population surveyed

Legend: ■ Symptomatic before ▨ Symptomatic after ■ Acute Symptomatic before ▨ Acute Symptomatic after

Neck / Arms / Shoulder / Top of Back: 62%, 45%, 13%, 8%
Elbow / Forearms / Wrist / Fingers: 34%, 29%, 10%, 6%
Lower Back: 47%, 33%, 11%, 6%

Results

Total number of respondents: Before 1139 / After 836
Populations are comparable in terms of seniority and location
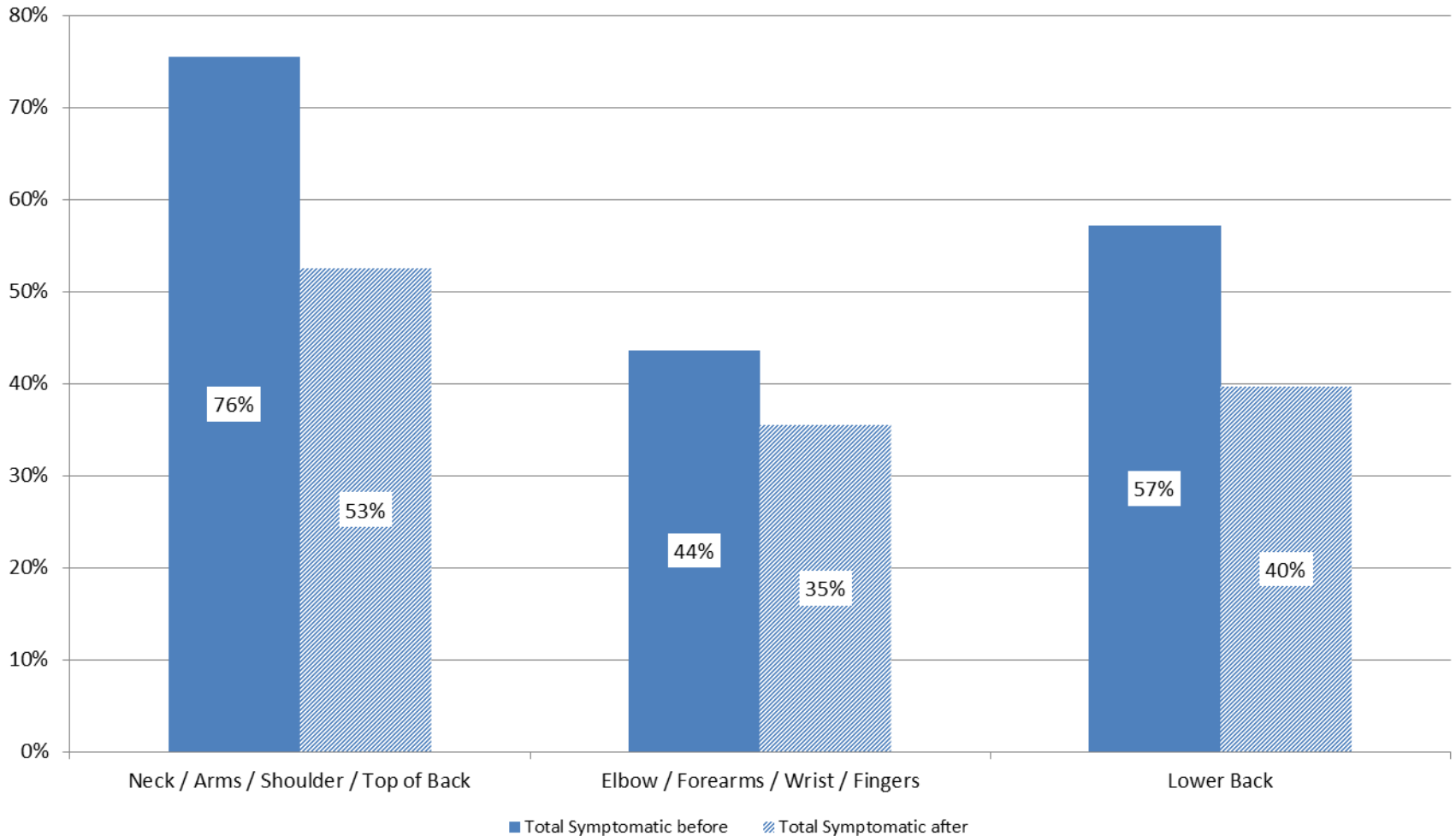The differences observed are statistically significant p <0.05

Distribution of% of cases by zone (compared to the population surveyed)

Discussion / Conclusion

- The Preciseo device is effective on MSD, particularly for upper-body (-23%) and lower back (-17%) zones;
    - In total there is a decrease of 49% in painful zones

- According to a complementary study conducted in parallel, the Preciseo device seems to have no effect on dermatitis and rhinitis, so it seems to be specific for MSDs.

- The survey was also carried out among hairdressing salons (225) that did not participate in the Preciseo operation and that do not have the Sustainable Development label: there is a generally greater prevalence of MSD in these salons than in those salons that did participate in the Preciseo operation (for more severe symptoms). There is **little or no selection bias** therefore that can be attributed to a strong prevalence of MSD (before the purchase of the special wash basin) for the latter. In other words it seems that hairdressing salons equipped with "Preciseo" did not purchase this ergonomic equipment because they had a greater prevalence of MSD than the others.

*The effectiveness of the Preciseo device on MSD
sends out a positive and encouraging medico-economic signal.*