



Revealing actionable knowledge from data for more inclusive and fair employment in transport sector: The DIAMOND Project

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The DIAMOND Project



Validation in four specific public and private transport sector scenarios



1. Railways and public multimodal transport

Research study on stations safety, accessibility and capacity to address basic mobility needs from a gender perspective. Validation of the self-diagnose and DSS tool for infrastructure and transport service planning.



2. Autonomous vehicles

Analysis of the comfort and perception of safety of automated vehicles to adapt the design and functionality of AV.



3. Vehicle (bike) sharing

Evidence of needs and requirements in the planning of vehicle sharing services addressing gender. Validation and diagnosis of DIAMOND's Decision Support System for vehicles points and fleet distribution and location planning.



4. Corporate social responsibility and employment

Research on women's participation in the transport and logistics sectors crossed with concrete job positions and new opportunities to translate this understanding into concrete better gender-oriented job descriptions and use of adapted candidate search processes.

Funded under H2020-EU.3.4 'Societal Challenges - Smart, Green And Integrated Transport';
MG-4-3-2018 'Demographic change and participation of women in transport';

GOAL: turning big and small data from different sources into actionable knowledge for addressing gender-specific needs in current and future transport systems;

CONSORTIUM: 14 partners based in 7 European Countries.





Thematic analysis main findings:

- **Employment within the worldwide transport sector**, inclusive of all its complex dimensions; air, sea, road, rail, space and logistics – have traditionally been viewed as male dominated and as a result, transport policy has been **male-oriented**, devised by men and centred around male lifestyles (Buchmann 2013;VWright 2014).
- There is **marked gender segregation within the sector**, with women employees typically placed in gender-typical positions, with **60% of female employees holding positions in the human resource department** compared to **only 3% of train drivers** (European Commission, 2016).
- Job segregation is also highlighted by the **working practices** operationalised in organisations, for example long working hours **that are not always family friendly**, particularly in the case of certain **mobile professions** that may require prolonged absences from home and an inflexible approach to work (Wright 2014; Giannelos et al. 2018).
- In relation to employment in the transport industry, **all people should have fair and equal opportunities to access all types** (levels, occupations etc.) of employment and the **relevant training and educational opportunities** however that this is usually not the case for **many groups of women (e.g. those with dependent children etc.)**. One factor which emerged from the literature as a barrier to women is the lack of family friendly working practices, such as providing flexible working, shift patterns and opportunities for part time (VWright 2014)
- Women in the workplace in **general face more discrimination than men** (Corral and Isusi 2007; Anciaes 2014; Giannelos et al. 2018).A further themes to emerge from the literature was related to a **lack of separate facilities for women in the workplace**

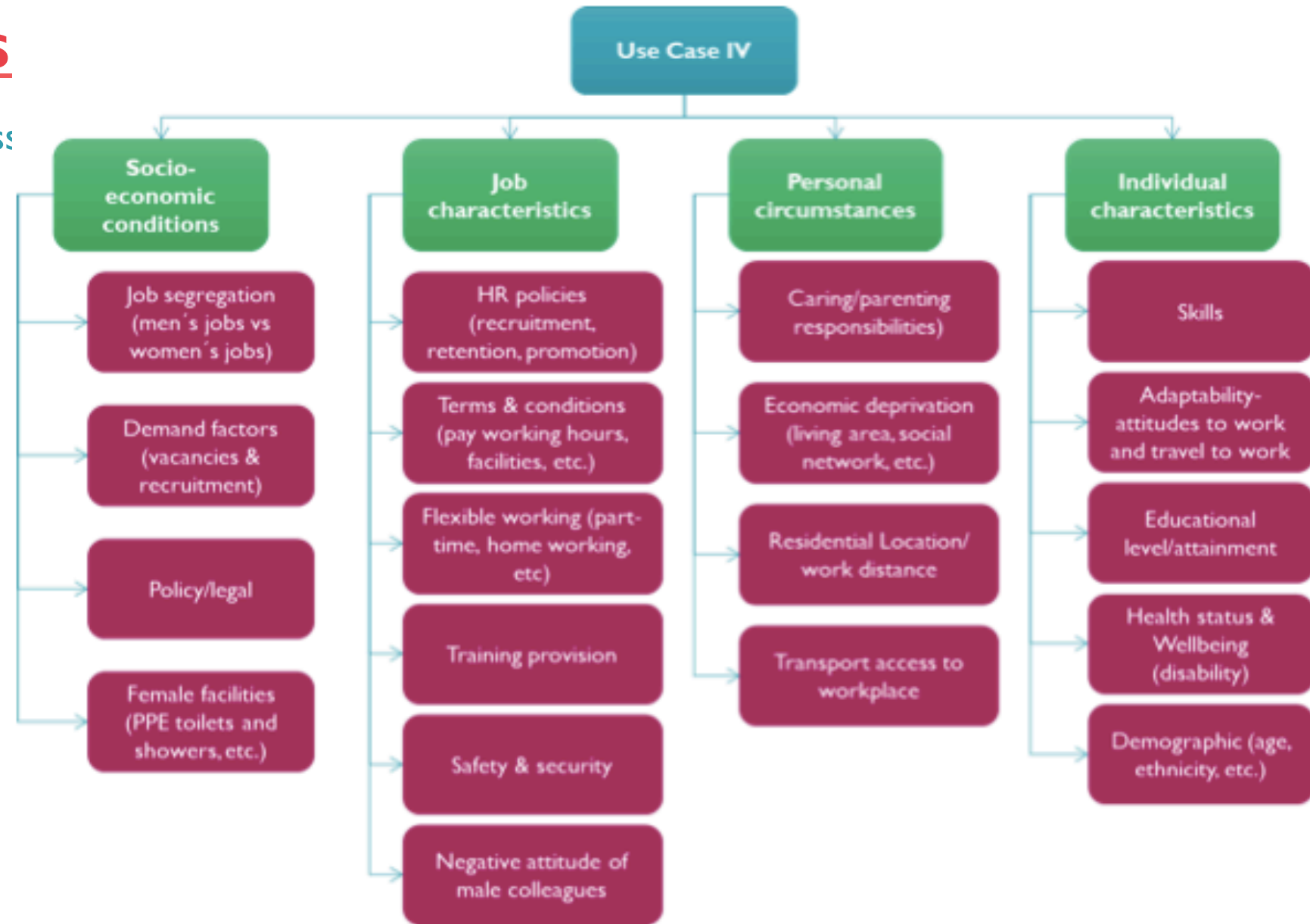
THEMATIC ANALYSIS

Identification of the FCs-Fairness



Railways and multimodal public transport

- **Focus Groups:** issues of equality in the transport sector in different EU countries;
- **Literature review:** Fairness Characteristics and relevant parameters.





Use Case IV Survey: surface transport org.



Ages ranged from **under 25 years** to **above 60 years**

Northern Europe



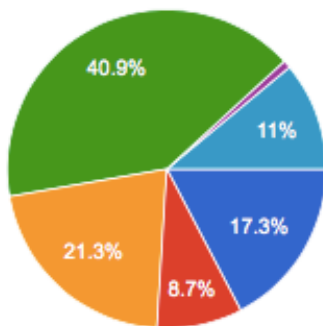
Total=129 respondents

A total of 129 employees (98 males, 29 females, and 2 prefer not to say)
The majority of respondents were:
White (99%),
Christian (79.8%),
married/in stable relationship (72.8%),
heterosexual (96.8%)
with a third level education (58.1%).
parents (78.2%),
not carers (91.3%),
do not travel with dependents on weekly basis (74.4%)
earn less than €70,999 (57.3%).
worked in public transport in the areas of planning, maintenance and administration (61.2%) and as middle managers (39.5%).

Only 8.5% of respondents report having an illness, impairment or disability that affects their work or travel in the last 12 months, and 6.25% of respondents report facing discrimination



- a. Front Line operator
- b. Supervisor/Foreman
- c. Office administrative staff
- d. Middle Manager
- e. Director
- f. Other,



Southern Europe

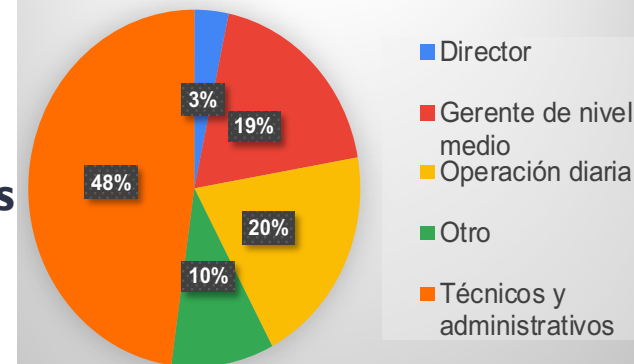


Total=90 respondents

A total of 90 employees (50 males, 33 females, 1 nonbinary and 6 prefer not to say) whose ages ranged from 18 years to 64 years were included.
The majority of respondents were
white (82.2%),
of no religion (65.6%),
married/in stable relationship that was heterosexual (72.2%),
heterosexual (85.6%)
with a third level education (71.9%).
parents (67.1%),
not carers (78/8%),
do not travel with dependents on weekly basis (68.9%)
and earn less than €50,999 (85.6%) worked in public transport in the areas of planning, maintenance and administration (67.8%) and as drivers (15.6%).

Only 1.1% of respondents report having an illness, impairment or disability that affects their work or travel in the last 12 months, and 9% of respondents report facing discrimination for working in or using transport due to their appearance.

Operational roles

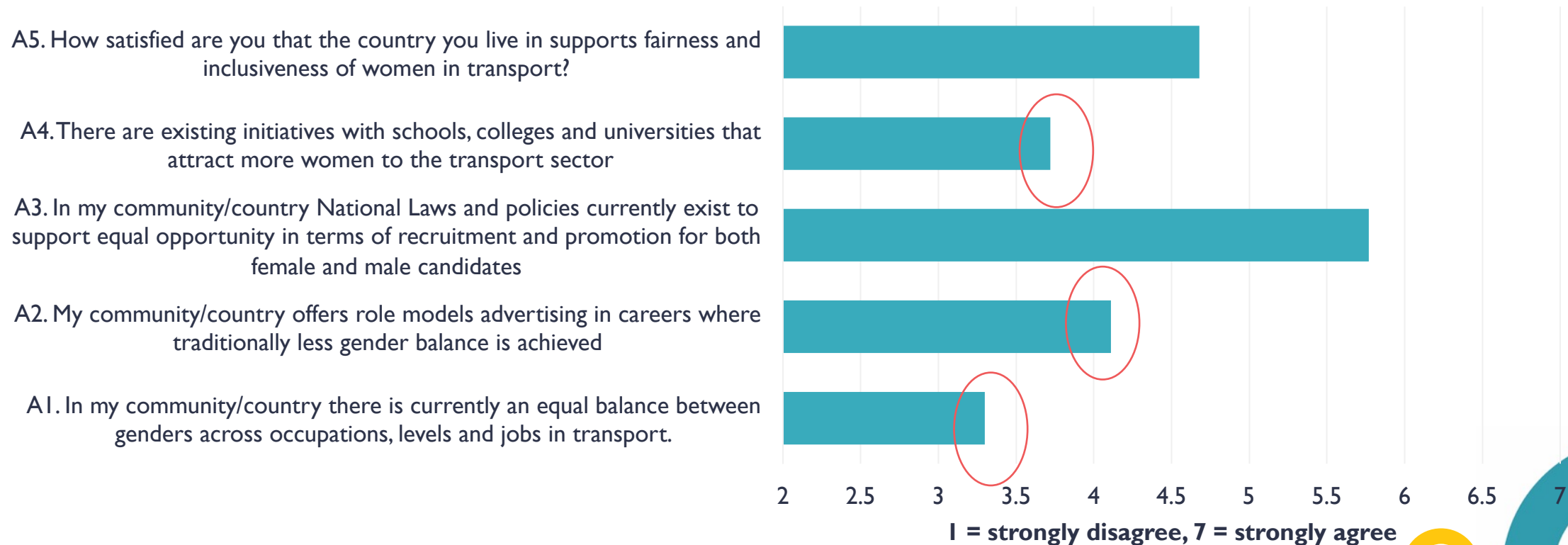


USE CASE IV: Your Work environment (Irish transport Operator)



- The survey aimed to examine work environment for employees by examining (a) job segregation/gender balance in their country/ community and (b) recruitment and promotion that promotes equality and fairness for women in transport. An overall satisfaction question was also included. Respondents rated questions on a likert scale of 1 (strongly disagree) to 7 (strongly agree). Below the means for each question are presented.

Your work environment



USE CASE IV:Your Work environment Data from Spanish organization



- Below the means for each question are presented.

Your work environment

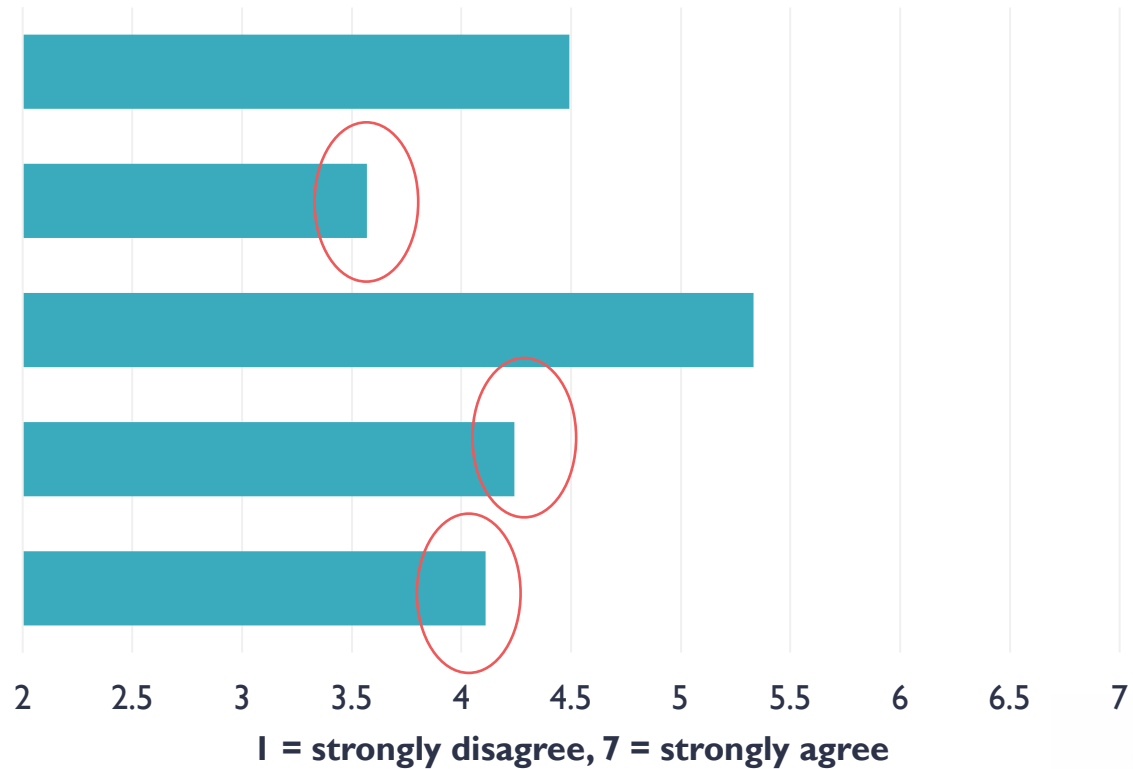
A5. How satisfied are you that the country you live in supports fairness and inclusiveness of women in transport?

A4. There are existing initiatives with schools, colleges and universities that attract more women to the transport sector

A3. In my community/country National Laws and policies currently exist to support equal opportunity in terms of recruitment and promotion for both female and male candidates

A2. My community/country offers role models advertising in careers where traditionally less gender balance is achieved

A1. In my community/country there is currently an equal balance between genders across occupations, levels and jobs in transport.

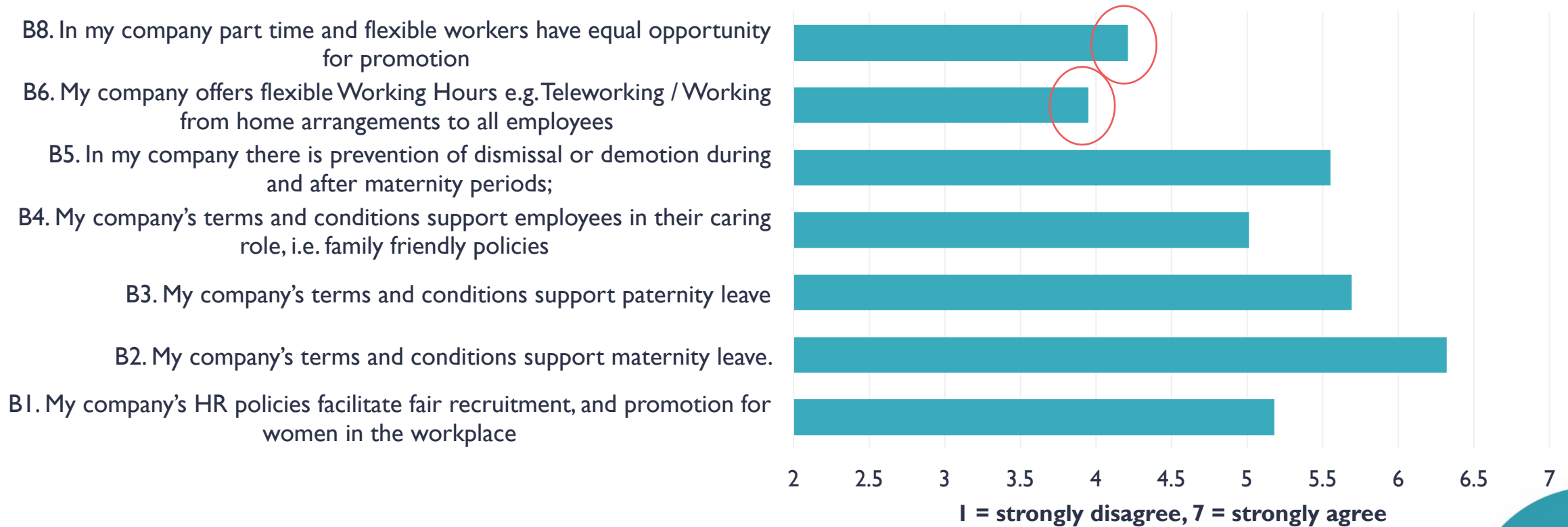


USE CASE IV: Job Characteristics(Irish transport Operator)



- The survey aimed to examine Job characteristics of transport workers through a series of questions. Respondents rated questions on a likert scale of 1 (strongly disagree) to 7 (strongly agree). Below the means for each question are presented.

Job Characteristics



USE CASE IV: Job Characteristics (Spanish organization)



- Below the means for each question are presented.

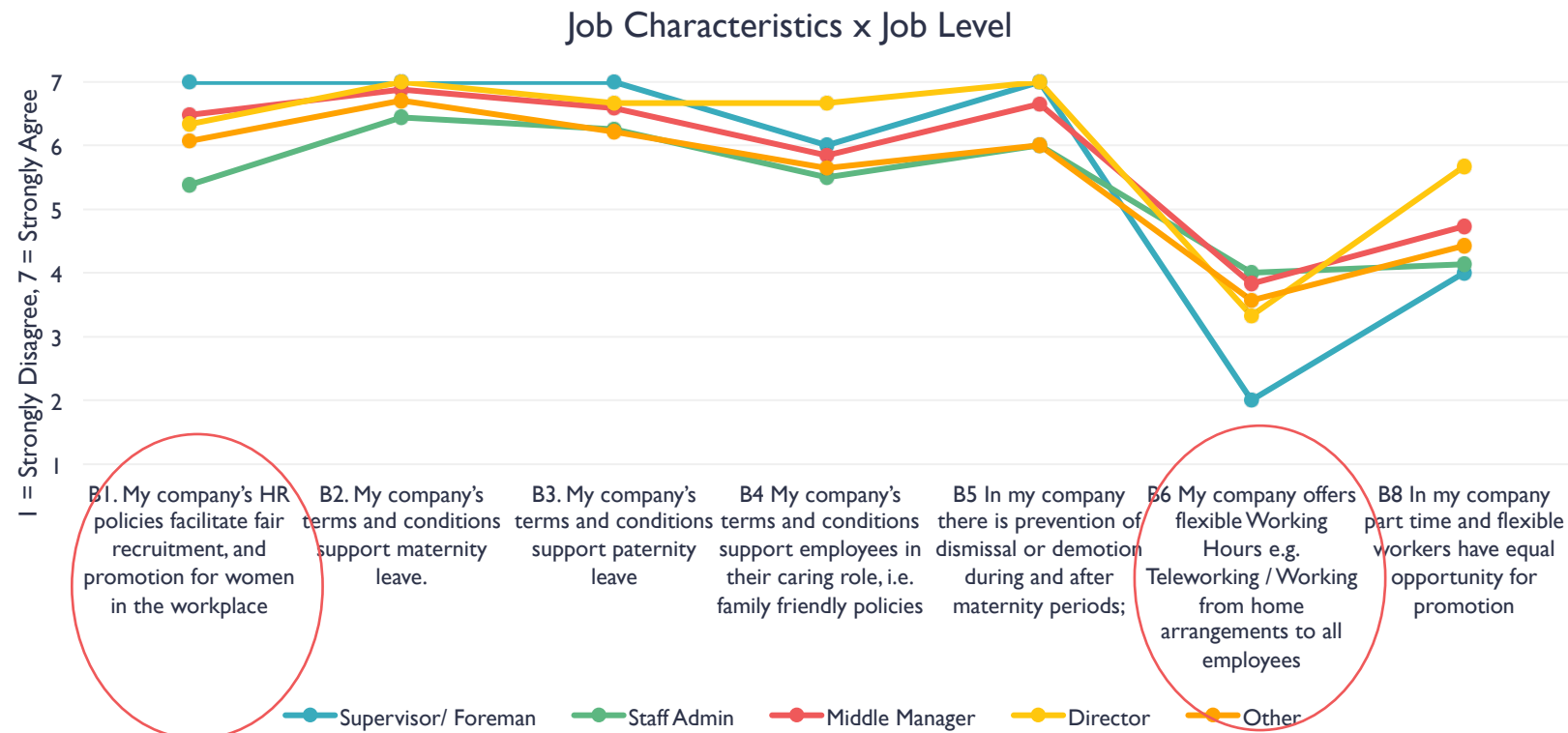
Job Characteristics



USE CASE IV: Job Characteristics x JOB (irish organization)



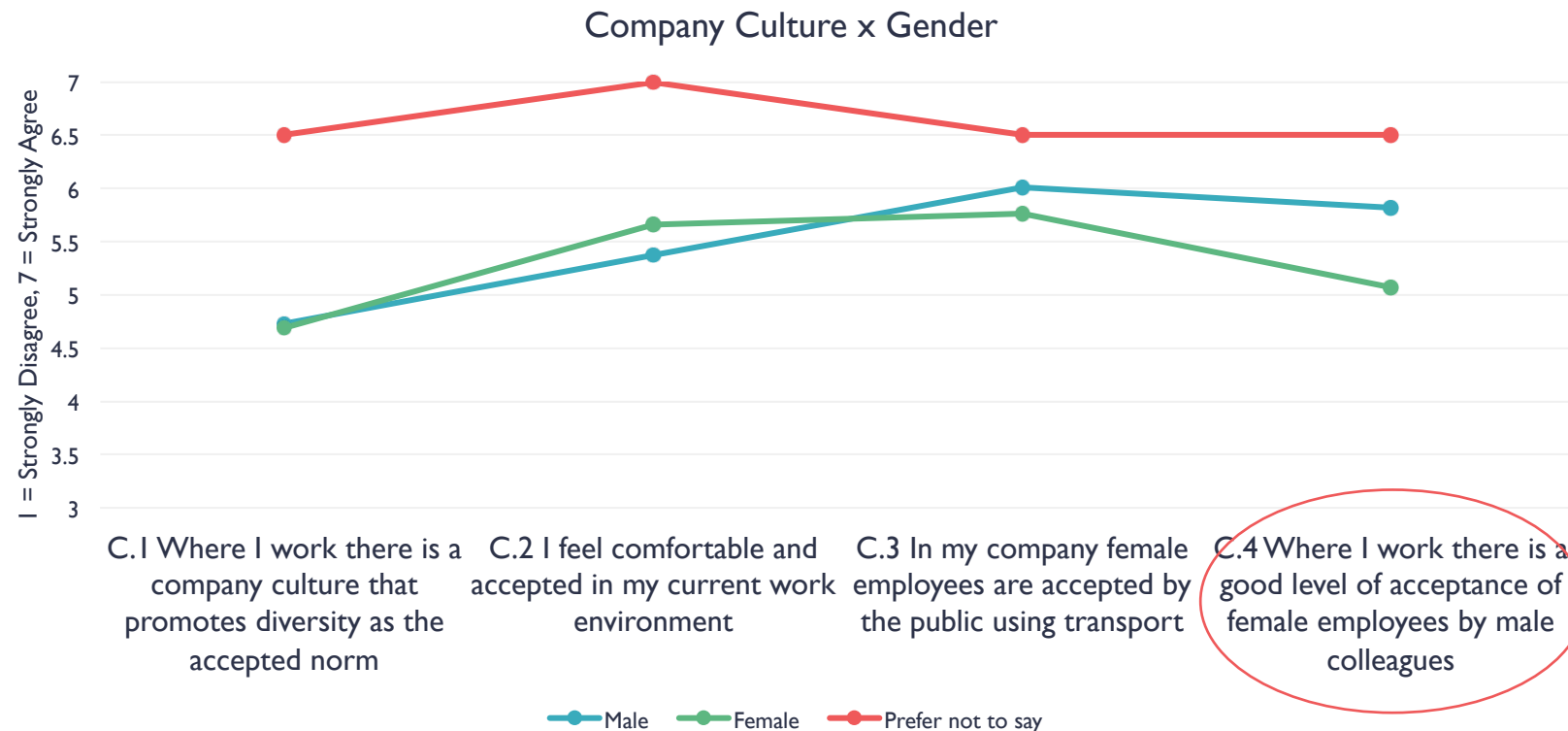
- Correlational analysis and one-way ANOVA showed no significant difference between the jobs except for one statement.
- My company's HR policies facilitate fair recruitment, and promotion for women in the workplace, $F(4,69) = 3.05, p = .022$, with supervisor/foreman ($M = 7, SD = 0$) agreeing more with this statement than other groups especially administrative staff ($M = 5.38, SD = 1.33$). NB. Sample size for supervisor/Foreman = 1.



USE CASE IV: Company Culture (Irish transport Operator)



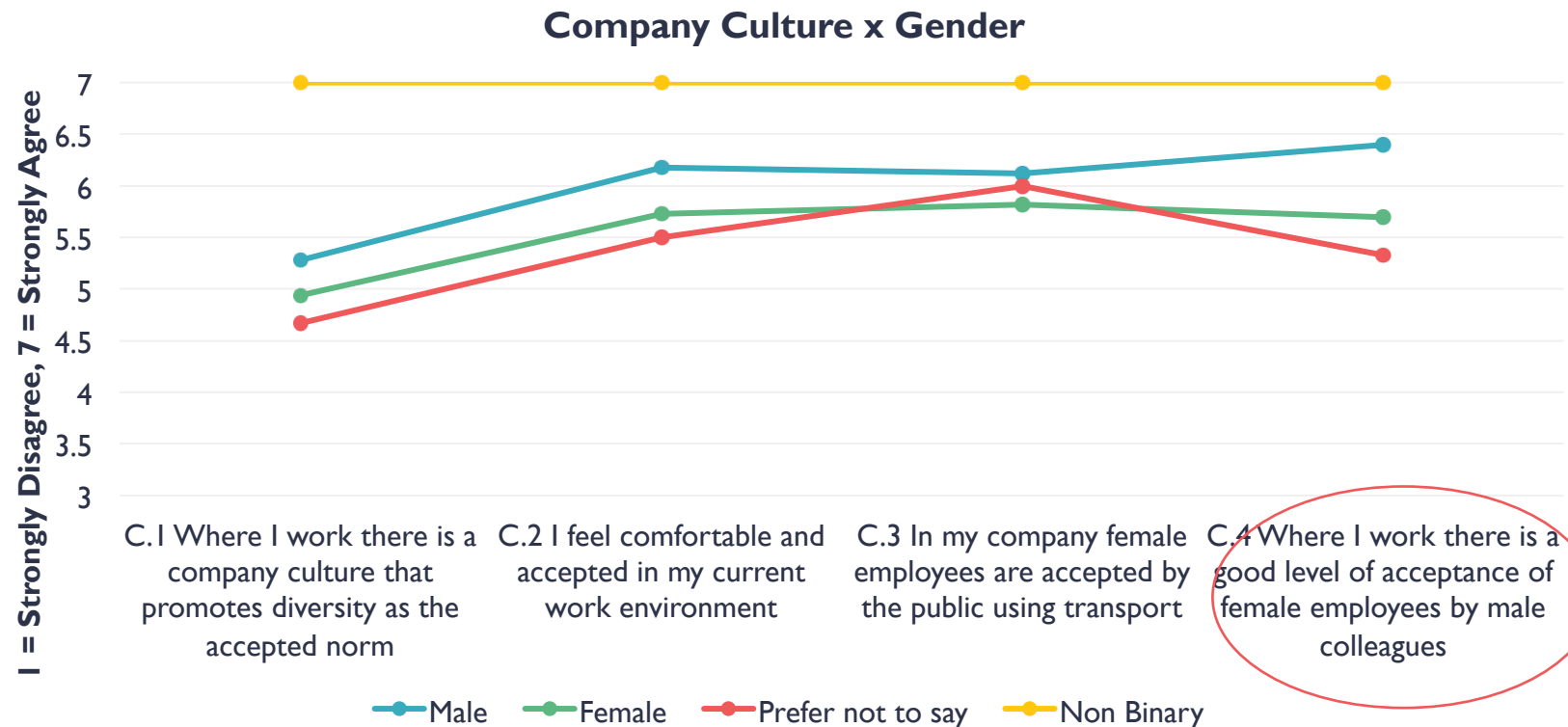
- The means for each question by gender are presented. **Although there is some discrepancy in mean scores across gender for each statement (e.g. prefer not to say response), correlational analysis and ANOVAs showed no significant difference between the genders except for one statement.**
- Gender differences: Where I work there is a good level of acceptance of female employees by male colleagues, $F(2, 125) = 4.42, p = .014$, with women disagreeing more with this statement than men.**



USE CASE IV: Company Culture(Spanish organization)



- The means for each question by gender are presented. **Although there is some discrepancy in mean scores across gender for each statement (e.g. prefer not to say response), correlational analysis and non parametric analysis (Kruskal Wallis H) showed no significant difference between the genders except for one statement.**
- Gender differences: Where I work there is a good level of acceptance of female employees by male colleagues, $H(3) = 8.02, p = .046$, with women disagreeing more with this statement than men.**



USE CASE IV: SAFE AND SECURE (Irish transport Operator)



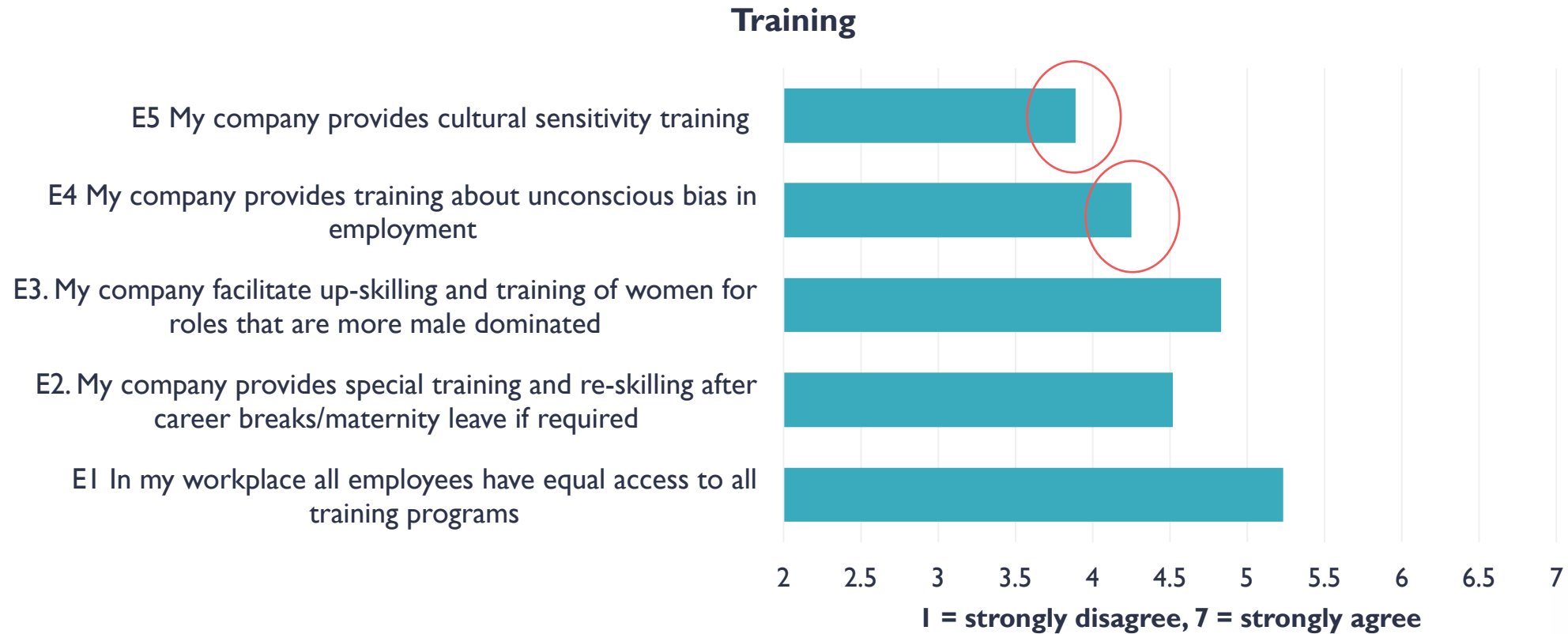
- The survey aimed to examine the safety and security of the organisation for employees. Safe and secure theme was assessed by a series of questions that examined how safe and secure was the workplace for respondents (e.g. training, H&S, Personal Protection Equipment, gender awareness training, anti-harassment and bullying policies). Respondents rated questions on a likert scale of 1 (strongly disagree) to 7 (strongly agree). Below the means for each question are presented.



USE CASE IV: Training ((Irish transport Operator)



- The survey aimed to examine the Training available for employees. Respondents rated questions on a likert scale of 1 (strongly disagree) to 7 (strongly agree). Below the means for each question are presented.



USE CASE IV: Overall Satisfaction(Irish transport Org.)



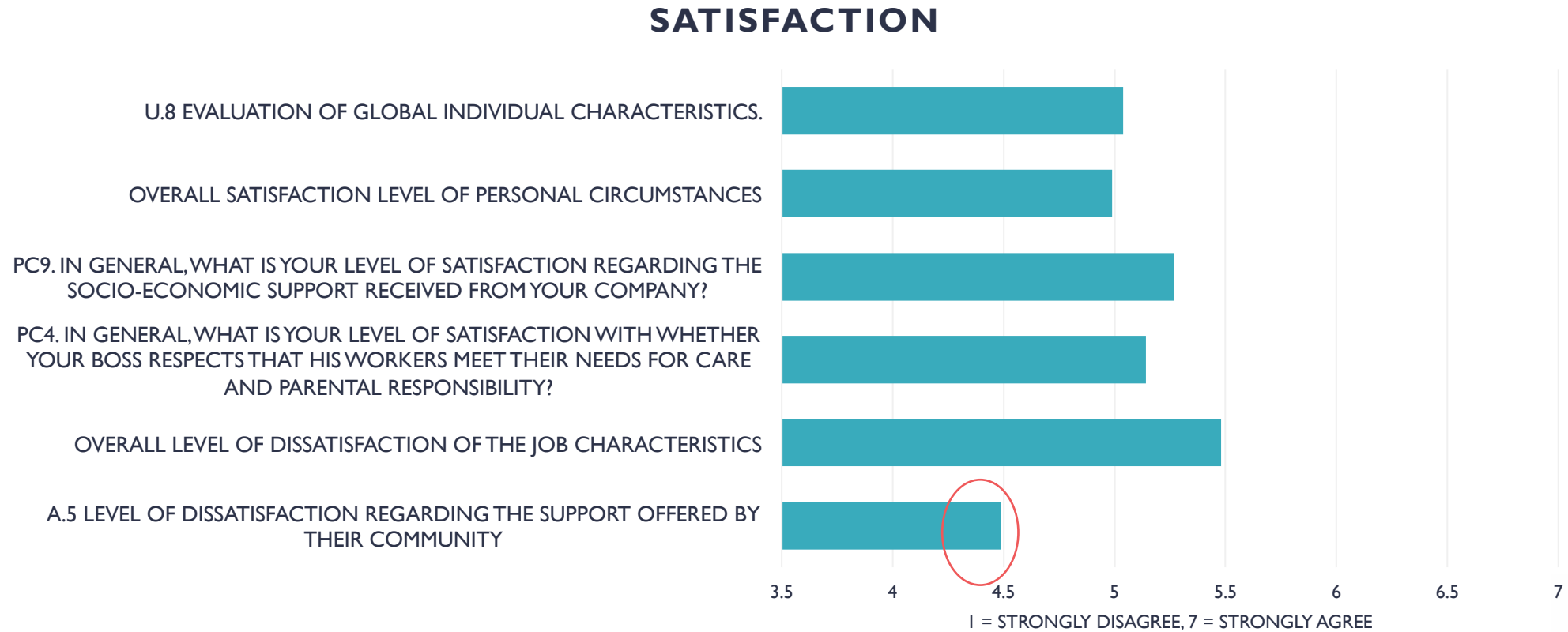
- Overall satisfaction was assessed across several questions to encapsulate different aspects of satisfaction with the organisation and working environment. Below the means for each question are presented.



USE CASE IV: Overall Satisfaction(Spanish Dataset)



- Below the means for each question are presented.



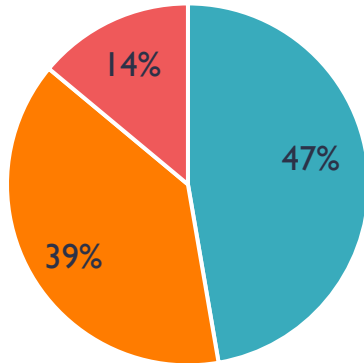


Special Covid related section of the questionnaire only
collected in another IRISH organization (a transport
operator) interim results

COVID Section of the Questionnaire(Irish transport Operator)



During the COVID 19 pandemic did you:



■ Work from home ■ Continue to work on site ■ Other

Covid risk: During the pandemic what impact did you perceive your work condition may have had in potentially exposing you to highest risk of contracting the virus? (1 low impact----7 high impact)

Covid anxiety: What impact do you perceive that your working conditions had during the pandemic towards your general anxiety level(1 low impact----7 high impact)

Cluster COVID average perception



Exploratory regression on factors influencing employees satisfaction with overall inclusiveness (Irish transport Operator)



Coefficients:

	Estimate	Std. Error	t value	Pr(> t)	
(Intercept)	0.02392	0.61071	0.039	0.968830	
`context job seg`	0.12465	0.04854	2.568	0.011685	*
`context education`	0.12616	0.04938	2.555	0.012101	*
`Org. HR policy`	0.20763	0.05761	3.604	0.000486	***
`Org Pat leave`	-0.12015	0.05733	-2.096	0.038575	*
`org Flex`	0.06555	0.04603	1.424	0.157441	
`org env accept`	0.09312	0.06240	1.492	0.138721	
`org. peer accept`	0.22497	0.06849	3.285	0.001399	**
`org. protect`	0.30185	0.06016	5.018	2.22e-06	***
`org. training access`	-0.07146	0.05595	-1.277	0.204461	
`sensitive training`	0.10252	0.04891	2.096	0.038540	*
`org. facilities`	0.10813	0.04504	2.401	0.018184	*
`org. special physicia needs`	0.15523	0.05892	2.635	0.009732	**
`PC needs. Working times require`	-0.05417	0.03575	-1.515	0.132821	
`PC needs extra time`	-0.09687	0.03612	-2.682	0.008535	**
`PC needs satisfaction`	0.10775	0.05497	1.960	0.052686	.
`PC need education`	-0.11934	0.04771	-2.501	0.013968	*
`PC socio-economic needs`	-0.17795	0.07229	-2.462	0.015511	*
`PC needs travel work`	-0.08089	0.04599	-1.759	0.081617	.
`PC financial support`	0.07382	0.05021	1.470	0.144558	
`Ind. Illness affect`	-0.11488	0.06038	-1.903	0.059912	.
`Ind trainign needs`	0.10154	0.05240	1.938	0.055413	.
`Ethnic minority`	-0.46404	0.28971	-1.602	0.112298	
`age affect`	0.17065	0.06484	2.632	0.009817	**
`Ind needs specific skill`	0.08958	0.04827	1.856	0.066386	.
`covid impact`	-0.06631	0.03707	-1.789	0.076639	.
`org. ad hoc training`	-0.12509	0.05439	-2.300	0.023502	*

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.7672 on 102 degrees of freedom
Multiple R-squared: 0.8345, Adjusted R-squared: 0.7924



Using a stepwise reresison model we identified out of the 45 factors explored the one having a more significant effect as predictor of overall Satisfaction with fairness and icnlusiveness in employment . For the irish sample they were:

- 1) Org. Hr policies for fairness
- 2) Org. protection of workers
- 3) Peer acceptance in the organization
- 4) Org. capability to cater for special physical needs
- 5) Org. capability to meet specific needs for "Ad-hoc" training
- 6) The capacity to meet the needs related to the effects of an aging workforce
- 7) Org. facilities and PPE for female as well as males
- 8) The effect of job segregation comign form the context
- 9) And education
- 10) As well as possibility for paternity leave

Exploratory regression on factors influencing employees satisfaction with overall inclusiveness (Spanish Operator)



Coefficients:

	Estimate	Std. Error	t value	Pr(> t)	
(Intercept)	-0.72489	0.77842	-0.931	0.35457	
`Org. HR policy`	0.35289	0.08140	4.335	4.25e-05	***
`Org fam friendly`	0.15154	0.08533	1.776	0.07959	.
`org dismiss`	-0.08144	0.04668	-1.745	0.08493	.
`PC needs. Support for carer`	0.09834	0.07339	1.340	0.18413	
`PC needs extra time`	0.12466	0.05061	2.463	0.01595	*
`PC needs satisfaction`	0.18464	0.08216	2.247	0.02740	*
`PC needs qualification`	-0.29592	0.10023	-2.953	0.00415	**
`PC needs promotion`	0.21396	0.09486	2.256	0.02686	*
`PC socio-economic needs`	0.28971	0.11216	2.583	0.01164	*
`ind chnges flex`	0.13745	0.06679	2.058	0.04290	*

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.984 on 79 degrees of freedom

(1 observation deleted due to missingness)

Multiple R-squared: 0.6194, Adjusted R-squared: 0.5712

Using a stepwise reresison model we identified out of the 45 factors explored the one having a more significant effect as predictor of overall Satisfaction with fairness and icnlusiveness in employment . For the irish sample they were:

- 1) Org. Hr policies for fairness
- 2) Org. capability to meet specific needs for “Ad-hoc” training/ qualifications
- 3) The capacity to meet the needs related to extra time and individul needs for flexible time
- 4) Org. protection of workers agains unfair dismissal
- 5) Org. capabilities for offering fair carreer progressions and promotions
- 6) Organizational capabilities to meet the demands of socio-economic related needs



CONCLUSIONS AND FUTURE WORKS



Towards policies and practice for inclusive mobility planning

- These results are going to be discussed in focus groups within each organization to help identify also more in-depth qualitative reasons behind them and also explore possible plans for improvements
- Current transport systems do not sufficiently take into account women in the design of products and services, and in fostering women's employability in the industry.
- DIAMOND project analyses and converts data into knowledge with notions of impartiality to support **gender inclusion in current and future transport systems** from the perspective of women as transport users and as professionals in the sector.



Focus groups



Structured Data



Observations



UESI Questionnaires



Social Media Data



DAD Survey





Thank you!



www.diamond-project.eu



[@DIAMOND_H2020](https://twitter.com/DIAMOND_H2020)



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