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Inequality at work

Occupations, organizations, and the wage distribution

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4. Essential Workers and Wage Inequality: Wage Differentials before and during the Covid-19 Pandemic, 2006 to 2022

Introduction

Essential workers are an emergent category in the current public discourse on labor market inequalities. The occupations that comprise essential workers are not new occupations, yet the Covid-19 pandemic has drawn attention to their role within the societal division of labor. During 2020, several European governments as well as the European Commission issued directives that declared specific occupations as critically important for maintaining the functioning of society. These directives eased Covid-19 related confinement measures for workers in those occupations allowing them to carry out their work without disruption (e.g., European Commission 2020b).

The classification of essential occupations put forward in those directives have broad commonalities across countries. Commonly those lists comprise jobs in the health and social care sector; involved with the supply of essential goods such as water, food or energy; education; logistics and transportation; waste disposal; public administration as well as emergency services like fire departments and law enforcement. In other words, essential workers maintain critical infrastructures that enable the continued fulfilment of central societal needs especially, but not only, during times of crisis.

The shared collective experience of the global Covid-19 pandemic has increased public awareness for the work performed by essential workers and has resulted in ongoing public debate on whether these workers are fairly paid given their critical contribution to the functioning of society. In response, research has started to assess the working conditions of essential workers. A small but growing body of research finds that the average wage of essential workers is lower compared to other workers across Europe (European Parliament, 2022; Koebe et al., 2020) and in the U.S. (Walke, 2021). However, strong internal variation of pay exists as essential workers are a heterogenous group spanning from lower-paid occupations such as agricultural laborers to higher-paid occupations like medical doctors (European Parliament, 2022).

In this chapter, I aim to contribute to the evolving literature on the economic position of essential workers in society. Despite its origin as a political construction of the state, there are good reasons to adopt the category of essential workers for the purpose of empirical research on wage inequality. First, I analyze wage differentials between essential and other workers within different strata of the occupational structure during the years preceding the Covid-19 pandemic in the Netherlands. I use the official designation of essential occupations by the Dutch government as an empirical test case to critically interrogate the long-standing functionalist argument in social stratification research that predicts higher wages for functionally important work net of skill requirements (Davis & Moore, 1945). During the analysis, I contrast the functionalist hypothesis with competing arguments that see wage determination more strongly rooted in ascriptive inequalities and labor market institutions. I test these alternative arguments by investigating how wage differentials between essential and

other workers link to gender composition and sectoral employment. This analysis has implications for broader policy debate. Contradictions between what governmental bodies define as important work *for* society and the factual distribution of economic resources among workers that governmental policy enables *in* society challenge the legitimacy of existing forms of wage inequality in the labor market.

As a second contribution, I assess whether the Covid-19 pandemic directly affected the wages of essential workers in the short-term. I argue that the collective experience of the Covid-19 pandemic affected the shared values and beliefs that underly the social recognition of occupations in society (Zhou, 2005), thereby strengthening the social esteem attached to essential occupations. To the extent that labor unions can transform a salient public appreciation of essential work into bargaining power during wage negotiations on behalf of essential workers, this has potentially improved the wages of essential workers relative to other workers since the onset of the Covid-19 pandemic.

To answer these research questions, I combine cross-sectional data from the Dutch labor force survey with precise job-level information on wages from the Dutch tax registers during 2006 to 2022 (Centraal Bureau voor Statistiek, 2022a, 2022b). Methodologically, the study improves on previous research that studies the wages of essential workers in one important way. Prior research has mainly relied on standardized international occupation codes to classify essential workers (e.g., European Parliament 2022). In contrast, I identify essential workers by combining international and native occupation codes with the Dutch industry classification to closely approximate the definition of essential work as propagated by the Dutch government. Combining occupational and industrial codes allows for a more precise identification of essential workers than in previous studies.³²

Theorizing Wages of Essential Workers

In the following section, I review earlier scholarship on wage determination that has touched on features of essential work that are salient in the current public debate. Those features can be categorized along the lines of (I) the task content of essential work and its relationship to skills, (II) care work as a pivotal domain of essential work and its relation to gender inequality on the labor market, and (III) the provision of essential work as a public good in contemporary political economies.

Tasks content of essential work & its relationship to skill

What sets essential work apart from other jobs is its specific task content that involves the maintenance of critical societal infrastructures. Tasks are an aspect of work that is distinct to skills and can independently determine wages (Autor, 2013). One theory that differentiates between tasks and skills in its explanation of unequal rewards is the functionalist theory of social stratification. It claims that wages are determined by two factors: the functional importance of societal roles and the scarcity of personnel that qualifies to fill these positions

³² For example, whether a software developer (occupation code 251 in ISCO-08, commonly defined as an essential worker) works either for a business consultancy firm (industry code M in SBI 2014) or for a healthcare provider (industry code Q in SBI 2014) should be taken into consideration when classifying essential work.

(Davis & Moore, 1945). In striking resemblance to contemporary definitions of essential occupations, Davis and Moore's concept of functional importance evolves around "essential services" that are "important to societal survival" (1945, p. 243). While functional importance is a job characteristic determined by the involved tasks, the scarcity of personnel derives from individual characteristics of workers - their innate talents and acquired skills - that enable them to carry out a given job.

As a close relative to human capital theory, functionalist theory considers tasks, or functional importance, only as "a necessary but not a sufficient cause" (Davis & Moore, 1945, p. 244) of higher rewards, while skills, or scarcity of personnel, takes precedence in its explanation of unequal wages. Davis and Moore argue that functionally important jobs only need to be rewarded higher if this premium ensures that these positions are sufficiently filled by qualified workers. Thereby, the theory defines an appropriate level of pay for essential workers in direct relation to the economic rewards of other workers. If working in other occupations is more attractive due to relatively higher wages, a sufficient supply of labor in essential occupations might not be attained and ultimately societies would fail to meet the provision of central functions such as health care, education, or food supply.

Previous research calls into question that wages of essential workers are higher once individual-level skill differentials are accounted for. Instead, wage penalties for essential workers remain even when controlling for educational qualifications in countries like Germany and Denmark (European Parliament, 2022; Koebe et al., 2020; Schrenker et al., 2021). However, for a more thorough test of the functionalist hypotheses, skill requirements need to be primarily controlled for at the level of occupations. In other words, the functionalist theory predicts higher wages for essential workers relative to other workers in occupational positions with comparable skill requirements. This necessitates to take a closer look at potential wage differentials across different levels of the occupational structure.

Pivotal role of care work and gender inequality

A second feature of essential work is its large component of jobs involving "face-to-face services that develop the human capabilities of recipients" or, in other words, care work (England et al., 2002, p. 455). Many essential occupations such as elementary school teachers and nurses feature care work and are predominantly performed by women (Budig & Misra, 2010; Dwyer, 2013). Recent estimates indicate that care workers make up about half of all essential workers in the U.S. (Folbre et al., 2021).

A large body of research shows that occupations with a large share of women in general and care work occupations in particular suffer a wage penalty on the labor market even after controlling for human capital variables (Barnett et al., 2000; Budig & Misra, 2010; Busch, 2018; Cohen & Huffman, 2003; England et al., 2002; Levanon et al., 2009; E. Murphy & Oesch, 2016; Ruijter et al., 2003). Devaluation theory explains this robust wage gap with a cultural bias against work that is carried out by women (England, 1992; Reskin, 1988). Wages of female-typed occupations are negatively affected by status beliefs that ascribe less worth to work performed by women relative to men (Auspurg et al., 2017; Jasso & Webster, 1997; Ridgeway, 2014). In the case of care work, skills associated with caregiving are naturalized as

innately female and free of additional training requirements, thereby rendering them invisible or not worth of compensation. In addition, cultural expectations that care work should be performed out of love and not for money can coerce paid care workers into accepting lower pay (Folbre & Nelson, 2000). Proponents of the theory of equalizing differences raise objections against devaluation theory by arguing that the wage gap is a result of women's willingness to substitute wages with other unobserved forms of compensation (Rosen, 1986). However, there is no evidence that fringe benefits like paid sick leave, health insurance contributions, or retirement plans are more generous in occupations where workers are predominantly women (Hodges, 2020).

Recent research shows that the devaluation process is complex and mainly bound to economic rewards, since the largest mismatches between symbolic and material valuation in society are found among female-typed occupations (Freeland & Harnois, 2020; Freeland & Hoey, 2018; Valentino, 2020). While many female-typed occupations are among the most highly respected occupations when measured by the means of deference scores, they are not among the highest paid. For example, social workers are highly esteemed in society for the work they perform, but earn on average less than other professionals (Freeland & Hoey, 2018). Valentino (2020) argues that this discrepancy stems from a process that culturally elevates the performance of gender-confirming roles while at the same time upholding material disadvantages. Freeland and Harnois (2020) conclude that the positively evaluated aspects of the work performed by female-typed occupations are systematically dismissed when it comes to pay setting.

A discrepancy between symbolic and material valuation also motivates the societal debate on the wages of essential workers as a whole (Schrenker et al., 2021) and is specifically striking against the backdrop of classic arguments in social stratification research. Parkin argued that incongruent distributions of social esteem and material advantage should be unstable as a mismatch between the two dimensions would erode normative support for existing inequalities (Parkin, 1971). However, the fact that such a discrepancy is empirically observable for female-typed occupations suggests that gender is a powerful status distinction that serves to legitimize the disparity between high social esteem and low material rewards and by extension upholds lower wages for many essential workers.

Provision of essential work as a public good

A third feature of essential work is its provision as a public good, most often in the form of public or non-profit sector employment. This should constrain the wage ceiling for essential workers due to several reasons. First, consumers of essential services like children in education or patients in health care often do not have the means to pay for essential services on an individual basis. Second, following the theory of Baumol's cost disease, productivity growth is slower in interpersonal services while at the same time wages of service providers need to keep up with other parts of the economy (Baumol, 1967). In combination, this gives rise to a target conflict between higher wages for service providers and cost containment. As a consequence, essential services are often provided in the public and non-profit sector where they are embedded in collective labor agreements and governed by strict budgeting rules. One common solution within such budgeting systems is to absorb rising costs by exercising wage

moderation in jobs that produce essential services. Recent research shows that prosocial jobs are remunerated less than other jobs that have similar job requirements and attract workers that are more willing to sacrifice pay for doing prosocial work (Fang & Tilcsik, 2022; Johnston & Johnston, 2019; Wilmers & Zhang, 2022).³³

These institutional limits to wages in the public and non-profit sector must be contrasted with the wage structure of the private sector. In the private sector, wage ceilings are less constraint by both budget and normative pressures (Ajdacic, 2022; Streeck, 2011). Rising wage inequality has mainly been an outcome of growth at the top end of the distribution (Lemieux, 2007; Parolin & Gornick, 2021; Piketty & Saez, 2003) and this rise of top-level wages is caused by an increasing ability of specific industries like finance (Tomaskovic-Devey & Lin, 2011) and private market-dominating firms (Autor et al., 2020; Tomaskovic-Devey et al., 2020) to capture large shares of national income. In turn, these employers are able to pay increasingly higher top-level wages to their managerial and professional workforce (Card et al., 2013; Lazear, 2019; Song et al., 2019; Wilmers & Aeppli, 2021). While wage setting is strongly coordinated in the Netherlands, firms have ample leeway to amend top-level salaries particularly in the private sector (Janietz & Bol, 2020). Moreover, national taxation systems can affect wage levels at the upper end of the distribution. A lower taxation of large wage incomes stimulates higher gross wages among top-earners (Thompson, 2022). Since the marginal tax wedge at the upper end is lower in the Netherlands compared to other coordinated market economies, this can contribute to an additional spike in private sector wages.

A bifurcation of wage ceilings by sector can drive the aggregate wage gap between essential and other workers. If the wages of essential workers who are predominantly found in the public and non-profit sector lack behind the top-level salaries paid in the private sector, the result would be an overall lower average wage. Moreover, following this argument, wage penalties for essential workers should be concentrated mainly among the managerial and professional workforce. It is in these segments of the occupational structure where selected other workers should be able to attain much higher compensation within the private sector of the labor market.

Summary

Based on the preceding discussion, I derive three testable empirical expectations on the wage gap between essential and other workers. First, the functionalist theory of social stratification predicts *a general wage premium for essential workers once differential skill requirements are accounted for on the level of occupations*. Second, devaluation theory predicts *wage penalties for essential workers within those strata of the occupational structure in which essential workers are predominantly women*. Third, arguments surrounding the provision of essential

³³ Importantly, the opportunity to do prosocial work should not be considered as an equivalent substitute for wages as claimed in theory of compensating differentials. Most essential workers would quite likely accept higher pay without hesitation. England, Budig, and Folbre (2002) rightly assert that the theory of compensating differentials is at its core a tautology. Every job can provide something that is of value for someone. For example, managerial jobs provide the opportunity to exercise authority. Thereby, the argument of hidden preferences can be applied to any job whether paid high or low.

work as a public good predict *wage penalties for essential workers in particular among the managerial and professional workforce.*

Wages of Essential Workers and the Covid-19 Pandemic

As a second research question, I ask whether the collective experience of the Covid-19 pandemic affected wage differentials between essential and other workers. The ongoing societal health crisis represents an unforeseeable global event that may have bolstered the public evaluation of essential occupations as being of value to society. First, selective essential occupations like nurses, elementary school teachers, or social workers enjoyed high levels of social esteem already before the onset of the Covid-19 pandemic (Freeland & Hoey, 2018). In these cases, the Covid-19 pandemic only served to highlight the nature of tasks performed by these essential occupations, personal services for a common public good, that explained their high esteem in the public eye all before 2020. Second, the health crisis has increased the salience of the societal contribution of several other essential occupations such as cashiers, logistics workers, or farm laborers that have received lower levels of valuation and recognition in the past. The prominent role of these occupations in keeping society functioning during the Covid-19 pandemic may have resulted in an increasing shared collective appreciation of their work since 2020.

Higher cultural esteem of occupations does not mechanically increase wages as the example of female-typed occupations emphatically demonstrates. To affect economic rewards, contingent wage bargaining processes, that take place either on a sectoral or organizational level, need to be amenable to a shifting valuation of essential work. Labor unions are central actors in this negotiation process and can translate a bolstered social esteem of essential occupations into higher wages for workers in those occupations. Unions represent important “pillars of the moral economy in modern labor markets” (Western & Rosenfeld, 2011, p. 517) that have cultural, political, and institutional leverage to actively enforce norms of fairness during wage negotiations (VanHeuvelen, 2018). A growing public appreciation of essential occupations has likely shifted broader societal norms of fairness in a direction that favors wage gains of essential workers and unions can draw on this shift as a source of non-market power (Elster, 1989; Wilmers, 2017b).

The current campaigning of the FNV (Dutch Federation of Labor Unions) illustrates how unions can culturally intervene in the moral economy on behalf of essential workers. Since 2021, the FNV organizes an ongoing public campaign series titled “*De Onmisbaren*” (“The Indispensables”) under the leadership of worker representatives. The central demand of the campaign is a substantive wage increase for essential occupations that is articulated against the backdrop of their societal contribution during the Covid-19 pandemic. Such encompassing forms of union advocacy might be of particular importance for the bargaining position of essential occupations like agricultural laborers that have exhibited a lower degree of worker organization during the past (ter Steege et al., 2012).

The outlined argument leads to a straightforward hypothesis: *wages of essential workers have improved relative to wages of other workers since the onset of the Covid-19 pandemic.* However, a temporal scope condition underlying the argument makes a null-finding

in the present analysis likely. The postulated effect hinges on the outcomes of completed collective bargaining rounds. The available time series for analysis until the third quarter of 2022 might be too short to capture the effect of interest since several collective labor agreements that affect essential occupations are only set beyond late 2022. At the same time, normative shifts might have their strongest impact in the short run while the experience of the Covid-19 pandemic is most salient. I return to discuss this limitation in the conclusion.

Data and Methodology

Sample

I combine data from the Dutch Labor Force Survey (*Enquete Beroepsbevolking*, (EBB)) and the Dutch population registers for the period between 2006 to 2022 (Centraal Bureau voor Statistiek, 2022a, 2022b). The EBB is a rotating panel. Upon entry, respondents are interviewed a total of five times before transitioning out of the sample. Interviews are administered on a quarterly basis. For the first part of the analysis (wage differentials before the pandemic), I limit the EBB sample to the first observation of each respondent upon entering the panel. By doing so, I set up a repeated cross-section with a changing sample of respondents from year to year. For the second part of the analysis (impact of the Covid-19 pandemic on wage differentials), I work with a quarterly time interval instead of years. I construct this data by utilizing all observations of the quarterly rotating EBB starting from 2017 until the most recent available quarter at the time of analysis (third quarter of 2022).

I supplement the EBB with wage data from the Dutch tax registers. The analysis focuses on the main job of a person that is defined as the job with the most hours worked at the time of the survey. For the first part of the analysis, I aggregate all wages and hours for each main job over the full calendar year. For the second part, I aggregate all wages and hours for each main job within the same quarter in which the survey interview took place.

I restrict the sample to workers between the age of 16 and 65, and exclude respondents working in the armed forces and extraterritorial organizations. The final weighted sample comprises 680,702 yearly observations between 2006 to 2019 and 854,224 quarterly observations between the first quarter of 2017 and the third quarter of 2022. The survey weights of the EBB are applied throughout the analysis, but are rescaled to ensure equal weight of each year (quarter) independent of the sample size.

Variables

The dependent variable in the analysis is the logged real hourly wage of a respondent. The wage measure excludes overwork compensation and -hours. I adjust for yearly inflation rates with 2015 prices as the reference point. The primary wage measure does not contain bonus payments on top of the base wage. However, during the second part of the analysis, I benchmark the estimates against a specification that includes bonus payments in order to test whether changes in the wage gap since the start of the pandemic were potentially driven by alternative forms of compensation such as one-off payments.

The main independent variable is binary and identifies essential workers. This measure is based on the list of essential occupations that was published by the Dutch government at the

end of March 2020 (FNV, n.d.). I rely on two occupational classification schemes (ISCO-08 and the Dutch BRC 2014) as well as one industry classification scheme (the Dutch SBI 2008) to designate the status of working in an essential job. The coding scheme was developed by Statistics Netherlands to report an estimated absolute number of essential workers that qualified for exemptions from Covid-19 related confinement measures to the Dutch government in 2020. One important clarification concerning this measure is warranted. A definitive translation of the government list is difficult to accomplish. The list denotes broad job descriptions that do not always correspond neatly to categories in the occupational classification schemes. I provide the translated government list and the coding scheme as an additional appendix for interested readers to ensure transparency of the coding decisions.³⁴

Several additional variables are featured in the analysis. These variables comprise education and age to account for individual qualification levels and work experience in line with the functionalist theory's premise. Age is included as a linear and quadratic term in the regression models. In line with the hypotheses, I devote specific attention to gender composition and sectoral employment (private, public, and non-profit). Additional controls account for immigration biography and descendency as well as the presence of children (0-18 years old) in the same household. I draw on the first digit level of the ISCO-08 (nine major occupation groups) and the SBI 2014 (20 industry categories) to differentiate between more detailed labor market segments.

Methodology

I use the following linear regression model to analyze wage differentials between essential and other workers:

$$\ln wage_{it} = \alpha + \beta Essential_i + \gamma_t Year_t + x' + \varepsilon_{it} \quad (4.1)$$

where $\ln wage_{it}$ is the log real hourly wage of individual i observed in year t . $Essential_i$ is the binary indicator that identifies essential workers and $Year_t$ is a set of year fixed effects. I sequentially add additional control variables (x') to the model and report the estimated (covariate adjusted) marginal effects of working in an essential job on the log real hourly wage.³⁵

In a second step, I analyze wage differentials within major occupation groups (1st digit of ISCO-08). With this approach, I take for granted an underlying hierarchy of occupations along the dimension of skill requirements and focus on whether it pays off to be an essential worker within the same strata of skill prerequisites (e.g. among professionals). Lower wages for essential workers within major occupation groups would contradict the empirical prediction of a functional task premium. To give an example, nursing professionals have been designated as essential workers in response to the Covid-19 pandemic. Their work contributed to a continued provision of health care services while being exposed to a heightened risk of infection at their workplace. Although nursing professionals might earn a higher wage than essential workers in other major occupation groups that are characterized by lower skill

³⁴ The translated government list and the coding scheme can be found in the appendix.

³⁵ Detailed estimation results can be found in Table A.12 and A.13 of the appendix.

requirements, they might still receive lower wages relative to other workers within their own occupational strata of professionals.

For this part of the analysis, I extend Equation 4.1 by modelling a two-way interaction between the essential worker identifier and the major occupation group indicator. In a first specification, I include education and age as individual-level human capital controls. In a second model, I control for the heterogenous effect of gender across major occupation groups to assess in how far the remaining education and age adjusted wage gap within each major occupation group is related to the underlying gender composition. I repeat the same strategy in a third model to assess the impact of sectoral employment on the education and age adjusted wage gap within each major occupation group.

In the second part of the analysis, I implement a difference-in-differences design to assess the effect of the Covid-19 pandemic on the wage gap between essential and other workers. The effect is identified with a two-way fixed effects model:

$$\ln wage_{ijt} = \alpha + \beta Essential_{it} + \gamma Pandemic_t + \nu Essential_{it} * Pandemic_t + \delta_t Quarter_t + \varphi_j Industry_j + \theta_j (Industry_j * t) + \varepsilon_{ijt} \quad (4.2)$$

where ν of Equation 4.2 is the coefficient of interest that is captured by an interaction between a binary indicator of working in an essential job and a binary indicator of the time period since the onset of the Covid-19 pandemic in the Netherlands (after the first quarter of 2020). δ_t are time unit fixed effects and φ_j are industry fixed effects. In addition, I relax the common trends assumption by allowing for group-specific linear wage trends existing before the pandemic and extending into 2020 and beyond. Since collective labor agreements are mainly set at the level of industries, I capture these heterogenous linear wage trends across industries with θ_j .^{36,37}

One challenge of working with repeated cross-sections in a difference-in-differences setting is the potential compositional change that may drive changes in the wage gap over time. Such a compositional change is a plausible scenario in the case of the Covid-19 pandemic. The extended period of governmental restrictions that involved the closure of large parts of the hospitality and retail sector may have had an impact on the occupational structure of the Netherlands. Occupations in these sectors may have decreased in relative size in comparison to jobs that were less affected by restrictions in response to the Covid-19 pandemic. As a consequence, the average wage of both groups (essential and other workers) may have diverged due to a changing composition in terms of low- and high-paying jobs within those groups instead of being driven by wage changes within existing jobs.

I apply a reweighting strategy to assess the contribution of such compositional changes on the change in the wage gap between essential and other occupations. The idea behind this strategy is to counterfactually fix the occupational structure at its shape from before the start

³⁶ Detailed estimation results can be found in Table A.14 and A.15 of the appendix.

³⁷ I estimate a second set of difference-in-differences models that includes major occupation group fixed effects (see Table A.16 in the appendix). In these alternative specifications, changes in wage differences are analyzed within major occupation groups. The results lead to similar conclusions.

of the Covid-19 pandemic in the Netherlands (before the first quarter of 2020). The strategy is implemented by applying an adjustment factor λ_{occ} to the quarterly survey weights w_{it}

$$w_{it}^* = \begin{cases} w_{it} * \lambda_{occ} & \text{if } Pandemic_t = 1 \\ w_{it} & \text{if } Pandemic_t = 0 \end{cases} \quad (4.3)$$

with

$$\lambda_{occ} = \frac{p_{Pandemic=0}^{occ}}{p_{Pandemic=1}^{occ}} \quad (4.4)$$

This survey weight adjustment increases (decreases) the contribution of workers who work in occupations that have contracted (expanded) since the start of the Covid-19 pandemic relative to the period between the first quarter of 2017 and the first quarter of 2020. When applying this adjustment, a smaller effect size of the estimator would indicate that the effect is partially driven by compositional changes in the occupational structure.

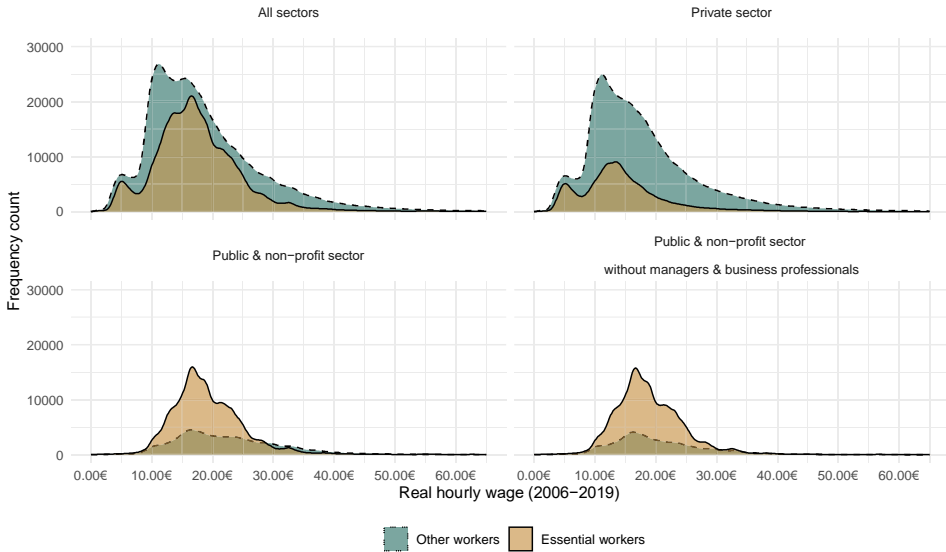
Results

Table 4.1 presents descriptive statistics on the group-level composition of essential and other workers during 2006 to 2019. The estimated relative share of essential workers is with 37.33% similar to previous estimates from across the European Union (European Parliament, 2022). In general, the composition of both groups is comparable when it comes to most individual-level variables. However, there are clear differences in the composition by gender and sector. Women make up more than 60% of all essential workers compared to around 40% among all other workers. In addition, essential workers are more often employed in the public and non-profit sector. Looking at wages, there is a raw average wage gap of 1.22 €/h to the detriment of essential workers. The within-group variation of real hourly wages is larger among the group of other workers.

| | Other Workers | Essential Workers |
|--|---------------|-------------------|
| Real hourly wage | | |
| Mean | 18.97 € | 17.75 € |
| SD | 13.60 | 9.37 |
| Age | | |
| Mean | 39.39 | 39.60 |
| SD | 12.53 | 13.13 |
| Education | | |
| ISCED 1-2 | 23.07% | 21.06% |
| ISCED 3-4 | 42.81% | 43.51% |
| ISCED 5-8 | 34.12% | 35.43% |
| Gender | | |
| Woman | 40.84% | 61.07% |
| Child (0-18) in household | | |
| Yes | 44.30% | 46.30% |
| Immigrants and their (direct) descendants | | |
| With own migration experience | 10.28% | 8.25% |
| Without own migration experience | 8.74% | 7.84% |
| Sector | | |
| Private sector | 84.21% | 39.74% |
| Non-profit sector | 3.56% | 40.60% |
| Public sector | 12.23% | 19.66% |
| Summary | | |
| % of Total | 62.67% | 37.33% |
| Min | 35.12% (2008) | |
| Max | 38.76% (2019) | |

Table 4.1 - Descriptive statistics by essential worker status (2006-2019)

(Note: Author's own calculations. Sample includes all main jobs of dependent employed workers aged 16-65. Main jobs are defined as the job with the most hours worked at the time of the survey. Pooled sample between 2006 to 2019. Survey weights are applied.)



Source: EBB & SPOLIS, 2006–2019

Figure 4.1 – Wage distribution by essential worker status and sectoral employment (2006-2019)

(Note: Author’s own calculations. Pooled sample between 2006 to 2019. Panels are based on employment by sector. ‘Without managers & business professionals’ excludes workers with one digit code ‘1’ and two digit code ‘24’ of ISCO-08. Survey weights are applied.)

Figure 4.1 provides a detailed look at the pooled wage distribution between 2006 and 2019 disaggregated by sector. Several noteworthy facts can be taken from these distributional statistics. First, the highest wages in the Netherlands do not accrue to essential workers. The wage distribution of other workers is overall more strongly right skewed with a higher share of very high-earning workers. In contrast, the wage distribution of essential workers is symmetric with fewer cases of exceptionally high wages.³⁸ Second, the wage gap between essential and other workers is mainly an outcome of private sector wages. Most of the very high wages of workers who are not classified as essential are paid in the private sector. Moreover, wages of essential workers are in general lower in the private sector when compared to the wages of essential workers in the public and non-profit sector. Third, the highest wages in the public and non-profit sector often accrue to workers who are not classified as essential workers. These are predominantly managers and business administration professionals that likely exercise leadership roles in their respective public or non-profit organization. At the same time, the disparity between top-level pay of essential and other workers is overall smaller in these two sectors compared to the private sector. Overall, these descriptive findings support the assertion

³⁸ The smaller second peak at the bottom end of the wage distribution visible for the private sector is an outcome of minimum wage legislation. In the Netherlands, the minimum wage increases stepwise with age up until a worker is 21 years old. In particularly, firms in the retail industry take advantage of this legislation by mainly hiring young workers for frontline jobs.

that differences in the wage structure across sectors are an important aspect underlying wage differentials between essential and other workers.

Wage differentials before the Covid-19 pandemic (2006-2019)

I start the multivariate analysis of wage differentials with an assessment for the overall workforce (Table 4.2).³⁹ In a first model, I estimate the wage gap based on a function of essential worker status and year fixed effects. Throughout 2006 to 2019, the average wage of essential workers has been lower than the average wage of other workers and this penalty amounts to around -2%. Next, I adjust for individual-level human capital characteristics (education and age). The estimated negative effect of essential worker status on log hourly wages remains and is similar in size. This finding replicates earlier research on wages of essential workers that finds that group-level differences in educational attainment and age are insufficient explanations for existing wage differentials.

Next, I adjust for gender in addition to the human capital characteristics. The results indicate that gender and gendered patterns of labor market inequality play an important role in understanding the wage gap between essential and other workers. After controlling for gender, there is no negative effect of essential work on wages. Throughout 2006 to 2019, women were overrepresented among essential workers, while being, on average, paid a lower wage during the same time. These findings are in line with the prediction of devaluation theory. When adding additional covariates for the presence of children in the household and immigration biography, the estimated effect remains unchanged due to the comparable distribution of both covariates across the two groups of essential and other workers.

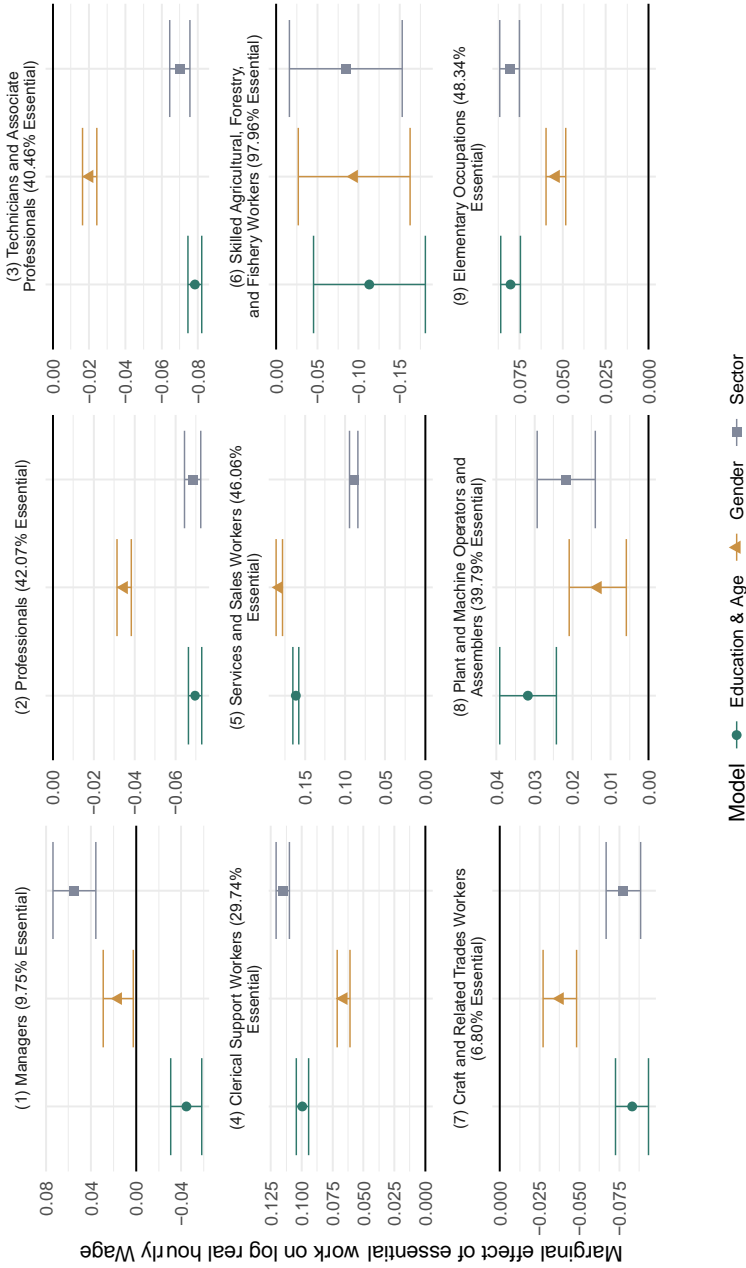
After adjusting for individual-level variables, I control for broader labor market segments (sectoral employment and major occupation groups). First, within sector and net of demographic controls, essential workers accrue a wage penalty of around -3%. The previously discussed wage distribution patterns by sector in Figure 4.1 suggest that these wage penalties are mainly an outcome of pay practices within the private sector. Second, I control for differential skill requirements at the level of occupations by adding the first digit of the ISCO-08 classification as a control in addition to the demographic controls. In line with the functionalist hypothesis, an aggregate wage premium for essential workers of around +4% is observable within major occupation groups.

³⁹ Detailed estimation results can be found in Table A.12 of the appendix.

| | Unadjusted | | Education & Age | | Gender | | Full Demographics | | Within Sector | | Within Major Occupation Group | |
|---|-------------------------|-------------|------------------------------|-------------|------------------------------|-------------|------------------------------|-------------|------------------------------|-------------|-------------------------------|-------------|
| | Log Real Hourly Wage | Hourly Wage | Log Real Hourly Wage | Hourly Wage | Log Real Hourly Wage | Hourly Wage | Log Real Hourly Wage | Hourly Wage | Log Real Hourly Wage | Hourly Wage | Log Real Hourly Wage | Hourly Wage |
| Essential Worker | -0.0237*** (0.00131) | | -0.0220*** (0.000916) | | 0.00964*** (0.000927) | | 0.00867*** (0.000922) | | -0.0315*** (0.00107) | | 0.0395*** (0.000879) | |
| Age | | | 0.0876*** (0.000250) | | 0.0881*** (0.000245) | | 0.0903*** (0.000257) | | 0.0894*** (0.000256) | | 0.0801*** (0.000245) | |
| Age ² | | | -0.000872*** (0.00000316) | | -0.000881*** (0.00000310) | | -0.000909*** (0.00000326) | | -0.000906*** (0.00000324) | | -0.000802*** (0.00000307) | |
| ISCED 1-2 | | | -0.200*** (0.00118) | | -0.205*** (0.00115) | | -0.199*** (0.00115) | | -0.188*** (0.00113) | | -0.123*** (0.00113) | |
| ISCED 5-8 | | | 0.335*** (0.00108) | | 0.336*** (0.00106) | | 0.335*** (0.00105) | | 0.318*** (0.00111) | | 0.176*** (0.00122) | |
| Woman | | | | | -0.156*** (0.000921) | | -0.142*** (0.00129) | | -0.161*** (0.00130) | | -0.125*** (0.00125) | |
| Child (0-18 years) in household | | | | | | | 0.0185*** (0.00195) | | 0.0195*** (0.00195) | | 0.0140*** (0.00129) | |
| Woman * Child (0-18 years) in household | | | | | | | -0.0492*** (0.00179) | | -0.0508*** (0.00177) | | -0.0434*** (0.00165) | |
| Immigrant 1 st generation | | | | | | | -0.138*** (0.00273) | | -0.136*** (0.00271) | | -0.0904*** (0.00245) | |
| Immigrant 2 nd generation | | | | | | | -0.0205*** (0.00272) | | -0.0221*** (0.00272) | | -0.0171*** (0.00258) | |
| Woman * | | | | | | | 0.0556*** (0.00366) | | 0.0600*** (0.00362) | | 0.0587*** (0.00326) | |
| Immigrant 1 st generation | | | | | | | 0.0402*** (0.00358) | | 0.0447*** (0.00356) | | 0.0344*** (0.00337) | |
| Immigrant 2 nd generation | | | | | | | 0.830*** (0.00495) | | 0.795*** (0.00504) | | 1.202*** (0.00503) | |
| Constant | 2.777*** (0.00249) | | 0.771*** (0.00500) | | 0.830*** (0.00495) | | 0.795*** (0.00504) | | 0.819*** (0.00502) | | 1.202*** (0.00503) | |
| Sector | | | | | | | | | | | | |
| Major Occupation Groups | | | | | | | | | | | | |
| Year Fixed Effects | x | | x | | x | | x | | x | | x | |
| Nr. of Observations | 680,702 | | 680,702 | | 680,702 | | 680,702 | | 680,702 | | 680,702 | |
| R ² | 0.001 | | 0.543 | | 0.566 | | 0.571 | | 0.577 | | 0.637 | |

Table 4.2 – Regression estimates of wages on essential worker status and controls (2006-2019)

(Note: Author's own calculations. Survey weights are applied. Standard errors in parentheses; * p<0.05 ** p<0.01 *** p<0.001)



Source: EBB + SPOLIS, 2006-2019

Figure 4.2 - Wage effects of essential worker status by major occupation groups (2006-2019)

(Note: Author's own calculations. All model specifications include a two-way interaction between essential worker status and ISCO-08 major groups (1st digit of ISCO-08) as well as year fixed effects. Model "Education & Age" includes additional individual-level controls for highest attained level of education, age, and age squared. Model "Gender" includes an individual-level control for gender and a two-way interaction between gender categories and ISCO-08 major groups in addition to education and age. Model "Sector" includes a control for sector and a two-way interaction between sector and ISCO-08 major groups in addition to education and age.)

As a next step, I take a closer look at existing wage differentials within each of the nine major occupation groups for a more fine-grained analysis (Figure 4.2).⁴⁰ Based on the functionalist theory of stratification, we would expect to find higher wages for essential workers within all nine major occupation groups. In contrast, devaluation theory predicts lower wages for essential workers within those major occupation groups in which essential workers are predominantly women. Lastly, the arguments surrounding the provision of essential work as a public service predicts lower wages for essential workers in particular in the highest-paid segments of the occupational structure (managers and professionals).

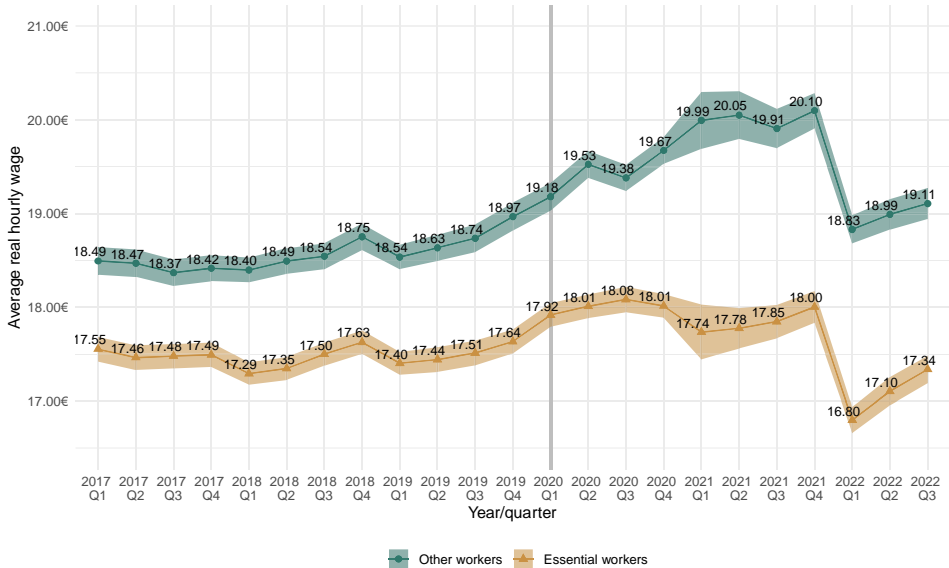
The results reveal strong variation in wage differentials between essential and other workers across major occupation groups (Figure 4.2). After controlling for education and age, wage premiums for essential workers are observable in four out of nine major occupation groups (Clerical support workers (~ +10%); service and sales workers (~ +15%); Plant and machine operators and assemblers (~ +3%); elementary occupations (~ +8%). In contrast, wage penalties for essential workers are observable in four out of nine major occupation groups (managers (~ -4%); professionals (~ -6%); technicians & associate professionals (~ -8%); craft and related trades workers (~ -8%). A ninth major occupation group, agricultural workers, consists almost exclusively of essential workers (97.96%), thereby making an interpretation of results for this group difficult.

These findings lend only conditional support to the prediction of the functionalist theory. Wage premiums for essential workers do exist, but they do not extend to all strata of the occupational structure. Importantly, higher wages mainly accrue to essential workers in the lower half of the established occupational hierarchy. Contrary to the prediction of functionalist theory, essential workers face wage penalties among managers, the professions and the associate professions. This pattern indicates that top-level wages drive the wage penalty for essential workers. The wages of managers and (associate) professionals who are classified as essential workers cannot keep up with the wages paid to other workers in the same strata of the occupational structure.

In line with devaluation theory, I find that the variation in wage gaps across major occupation groups is largely accounted for by gender composition (Figure 4.2). Within those major occupation groups with a wage *penalty* for essential workers, essential workers are predominantly women. Conversely, within major occupation groups with a wage *premium* for essential workers, essential workers are predominantly men. To give two examples: among the professions, women make up 68.54% of essential workers and 34.06% of other workers. Among the elementary occupations, women account for 34.77% of essential workers and 61.73% of other workers.⁴¹ While there is a wage penalty for the predominantly female essential workers within the professions, there is a wage premium for the predominantly male essential workers within the elementary occupations. The only major occupation group for which this pattern does not hold are service and sales workers. However, women are in the majority among both essential (78.98%) and other workers (63.00%) in this major occupation

⁴⁰ Detailed estimation results can be found in Table A.13 of the appendix.

⁴¹ Detailed descriptive statistics of share of women by major occupation group and essential worker status can be found in Table A.10 of the appendix.



Source: EBB + SPOLIS, 2017–2022

Figure 4.3 - Quarterly average real hourly wages by essential worker status (2017q1-2022q3)

(Note: Author’s own calculations. Solid line indicates the quarter (2020q1) during which the first cases of Covid-19 infections were reported in the Netherlands. Survey weights are applied.)

group. Overall, these findings demonstrate that wage penalties for essential workers are strongly tied to lower wages for women on the labor market.

In contrast to the devaluation hypothesis, the institutional hypothesis receives only mixed support. On the one hand, the wage penalty of essential workers among the managerial workforce is strongly driven by sectoral employment. On the other hand, controlling for sector does not explain the wage penalty of essential workers that exists among the (associate) professions. In these occupational strata, the wage penalty is more strongly tied to pay differences within sectors, specifically within the private sector.

Impact of the Covid-19 pandemic on wage differentials (2020-2022)

In the second part of the analysis, I investigate whether the wage gap between essential and other workers has become smaller since the beginning of the Covid-19 pandemic. I argued that wages of essential workers have potentially improved relative to other workers due to the collective experience of the Covid-19 pandemic, its consequences for the public evaluation of essential occupations, and subsequent union intervention. A visual inspection of the quarterly average wages for both groups since 2017 does not substantiate this proposition (Figure 4.3). While both trend lines have not been exactly parallel since at least 2019, they diverged more strongly since the start of the pandemic. Between the first quarter of 2020 and the fourth quarter of 2021, the average wage among other workers grew by around 5%, while the average wage of essential workers stagnated. Over this period, on the aggregate group-level, the average

| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 |
|----------------------------------|------------|------------|------------|------------|-----------|
| Log Real | -0.0492*** | -0.0277*** | -0.0207*** | -0.0162*** | -0.00262 |
| Hourly Wage | (0.00461) | (0.00400) | (0.00482) | (0.00470) | (0.00487) |
| Log Real Hourly | -0.0519*** | -0.0288*** | -0.0228*** | -0.0165*** | -0.00378 |
| Wage (+Bonus) | (0.00484) | (0.00418) | (0.00502) | (0.00492) | (0.00505) |
| Time Unit | | | | | |
| Fixed Effects | X | X | X | X | X |
| Industry | | | | | |
| Fixed Effects | | X | X | | X |
| Heterogenous | | | | | |
| Linear Industry | | | | | |
| Wage Trends | | | X | | X |
| Reweighted | | | | | |
| Occupational | | | | X | X |
| Structure | | | | | |
| Nr. of | | | | | |
| Observations | 854,224 | 854,224 | 854,224 | 854,224 | 854,224 |
| R² (Real wage) | 0.005 | 0.256 | 0.256 | 0.002 | 0.261 |
| R² (+ Bonus) | 0.024 | 0.271 | 0.271 | 0.020 | 0.276 |

Table 4.3 - Difference-in-Differences regression estimates (2017q1-2022q3)

(Note: Author's own calculations. The displayed estimates are coefficient ν of Equation 2 based on linear regression models as outlined in the methodology section. Models include controls and survey weight adjustments as indicated. Standard errors in parentheses; * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$)

wage of essential workers fell more behind instead of catching up relative to the average wage of other workers. Since the beginning of 2022, the wages of essential workers have grown at a slightly higher rate (around 3% compared to 1.5%). At the same time, high inflation in 2022 has resulted in a sharp welfare loss among all wage earners.

Table 4.3 displays the results of the difference-in-differences models.⁴² I find that the divergence of average wages to the detriment of essential workers was driven by pre-existing heterogenous industry wage trends and a changing occupational composition. When looking at base wages and wages including bonus payments, there is no significant effect of the Covid-19 pandemic on wage differentiation after accounting for both factors. Overall, the results do not support the initial hypothesis. In the short-term, wages of essential workers do not have improved relative to the wages of other workers in the Netherlands since the beginning of the Covid-19 pandemic.

In an additional robustness analysis, I implement a difference-in-differences event study design with treatment effects for each separate time unit to test whether the average effect over the full Covid-19 period might obscure delayed wage gains of essential workers that materialize only in 2022. The results of this robustness check do not indicate a delayed effect and support the conclusions drawn from the main model.⁴³

⁴² Detailed estimation results can be found in Table A.14-A.16 of the appendix.

⁴³ The results of the difference-in-differences event study can be found in Figure A.6 of the appendix.



Source: EBB & SPOLIS 2017–2022

Figure 4.4 - Change in occupational employment before and during the Covid-19 pandemic

(Note: Author’s own calculations. Occupation units are defined by the third digit of ISCO-08. Occupation units are classified as essential occupations when they comprise at least 50% of essential workers during 2017-2019. Sizes of circles correspond to the relative size of occupations during 2017-2019. Hourly wage rank order is determined by the average hourly wage of occupations during 2017-2019. Change in share of total employment is expressed as percentage point differences. Value labels are displayed for the occupations with the largest change in the relative share of total employment. Smoothing lines are derived from a locally weighted first-order polynomial regression with a bandwidth of five occupation ranks.)

As a last step, I inspect more closely how the Covid-19 pandemic affected the occupational structure to better understand the sharp rise in the average wage among other workers relative to essential workers. I find that the Covid-19 pandemic has resulted in a marked re-composition of the occupational structure at least in the short term (Figure 4.4). Low-paying occupations contracted and high-paying occupations expanded in relative size in particular among occupations that mostly contain other workers. To give an example, the lower-paid occupations of waiters and bartenders (ISCO-08 code 513) and shop salespersons (522) shrunk profoundly in relative size, while the higher-paid occupations of software and applications developers and analysts (251) and administration professionals (242) grew strongly. The plausible cause of this change in composition is the Covid-19 pandemic and the confinement measures that were taken in response. At the same time, compositional changes have been less skewed among the occupations that contain essential workers, thereby contributing to a differentiation of the average wages at the group-level.

Conclusion

This study presents novel insights on the economic position of essential workers in society. In the analysis, I confirm the finding of an aggregate wage penalty for essential workers found in previous research. Beyond the overall average wage, the analysis reveals important variation

across different strata of the occupational structure in the Netherlands. While essential workers receive higher wages within the lower-paid segments of the occupational structure, they suffer a wage penalty within the higher-paid segments.

The findings further reveal that wage penalties for essential workers are closely linked to the gender inequality on the labor market. Essential workers receive lower wages particularly when they are predominantly women and higher wages when they are predominantly men within a given strata of the occupational structure. Not only are wage penalties that accrue to women within a given strata an infringement of a principle of comparable worth: equal pay for work that requires comparable skills, but these penalties also engender lower wages for essential workers particularly among the (associate) professions. The findings indicate that unequal treatment of work performed by women systematically overrules functional importance during wage setting processes within the higher levels of the occupational structure. While the devaluation of women's work itself is not a new finding, the current analysis shows that this process is deep-seated and persistent. Even the advent of a health crisis of global scale and the attention it drew to essential workers has done little to mitigate the devaluation of essential work that is primarily performed by women.

Wage differentials between essential and other workers are also linked to sectoral employment. The very high wages that are paid to selected other workers in the private sector contribute to the wage penalty for essential workers at the top of the wage distribution. On the flip side, essential workers who are very low paid work predominantly in the private sector in the Netherlands. Overall, the public and non-profit sector produce a more equitable wage distribution among essential workers as a group but also between the groups of essential and other workers. These findings caution against potentially rising wage inequality when essential services become privatized. For example, wages of care workers are already more strongly polarized in the U.S. where the provision of social services rely to a greater extent on private markets (Dwyer, 2013; Wilmers & Aeppli, 2021). An auxiliary analysis shows that the concentration of essential workers in the private sector has increased by around two percentage points between 2006 and 2019 in the Netherlands.⁴⁴ Future research should investigate which essential occupations are affected by this shift and to what extent this process affects aggregate wage inequality.

One limitation of the current study is that I do not focus in detail on ethnicity as another important categorical distinction that shapes labor market inequality. Previous research on wages of essential workers indicate that first-generation immigrant workers are overrepresented in those essential jobs that offer the lowest wages and exhibit the worst working conditions (Basso, 2020; European Parliament, 2022; Fasani & Mazza, 2020; Nivorozhkin & Poeschel, 2022). Future research should assess with greater care whether wage penalties for essential work are present among immigrant workers and in how far ethnicity shapes wage inequality within the group of essential workers as a whole.

⁴⁴ Detailed descriptive statistics of the concentration of essential workers across sectors can be found in Table A.11 of the appendix.

The findings also raise important questions about the future of contemporary labor markets. A case in point is the result that wages of essential workers cannot keep up with the overall highest paid wages in the Netherlands. In fact, among the essential occupations, only the wages of medical doctors can reasonably compete with the highest average occupational wages in the Dutch labor market (see Figure 4.4). The top-end of the wage distribution is otherwise dominated by occupations that are mainly composed of workers who are not classified as essential workers. This finding is in line with one central assumption of neoclassical economic theory on the functioning of labor markets. Neoclassical economics construes labor productivity as a general output in an economic exchange relationship between the seller and the buyer of labor regardless of what is to be produced. Thereby, it fully omits functional importance as a factor during wage determination. A job does not need to align with or contribute to essential societal functions in order to be remunerated highly. Left to unchecked market forces alone, the highest paid jobs in society will not necessarily be the most functionally important positions for society.

A mismatch between the distribution of rewards relative to the distribution of tasks that keep society functioning is subjectively unfair in the eyes of many observers and objectively a social problem for all. The potential consequence is an under-supply of essential work in society.⁴⁵ From the functionalist perspective, labor shortages in essential occupations are indicative of work that is societally important but underpaid. Continued surveillance of labor shortages charged by the European Commission indicates that selective essential occupations such as nursing professionals or agricultural & industrial machinery mechanics have been in shortage since even before the onset of the Covid-19 pandemic in several European countries (Eurofound, 2021; European Commission, 2020; European Parliament, 2022). Since 2020, the shortage of health care workers has further increased due to the Covid-19 pandemic and its challenges to public health. This problem will likely intensify as labor shortages within critical infrastructures are projected to rise further over the upcoming years. In the Netherlands, it is already felt today not only in the healthcare sector but also within the education system (Sociaal-Economische Raad, 2022). That many members of society, among them more women than men, still enter essential occupations today while often facing heightened work pressure due to staffing shortages is admirable. However, a more sustainable solution to mitigate labor shortages in essential occupations in the future would be to better attune wages of essential workers with those of other workers particularly in the upper half of the wage distribution.

The second part of the analysis shows that the collective experience of the Covid-19 pandemic has so far not resulted in a relative improvement of essential worker's wages relative to other workers. One limitation of the current study is that I can only trace potential changes until the third quarter of 2022. Relative wage improvements via the hypothesized pathway of union intervention may require more time to materialize. Future research should continue to monitor whether relative wage improvements for essential workers will be observable in the midterm. However, the window of opportunity to translate the experience of the Covid-19

⁴⁵ An undersupply of public goods is arguably a greater social problem for some citizens than for others, especially when high-income earners are able to compensate for the absence of public goods by consuming expensive private goods. Thereby, an undersupply of public goods can further aggravate social inequalities.

pandemic into bargaining power on behalf of essential workers is likely closing as soon as the pandemic has been fully overcome and, in an international perspective, the weakening of organized labor renders the success of union intervention uncertain (J. Rosenfeld, 2014).

Given an uncertain outcome of union intervention, what are other possible policy options to improve the relative economic position of essential workers? The fact that many essential workers are located in the public and non-profit sector in the Netherlands suggests another policy instrument: taxation. Higher individual-level taxation is likely not an effective option as employers could respond by simply offering larger absolute gross wages (Thompson, 2022). A more progressive taxation on exceptionally profitable firms offers greater promise. Advocates of free markets will counter that this is a serious interference in the economic liberty of organizations. However, it can be argued that business activity is not independent from essential services and relies on the contribution of essential workers on a daily basis. After all, how would companies be able to generate revenue in the absence of essential services such as drinking water, education and (mental) health care? In this sense, essential workers provide important advanced contributions to business activity. One potential way to honor these contributions would be to facilitate broader profit sharing via redistributive corporate taxation.