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# Methodological Report II

Implementation, Data Quality and Data Structure of the ERiK-Surveys 2020

Forschungsverbund



Deutsches Jugendinstitut  
Technische Universität Dortmund



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Jugendinstitut



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Implementation, Data Quality and Data Structure  
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## Researching children, youth and families at the intersection of science, policy, and professional practice

The German Youth Institute (DJI) is one of the largest social science research institutes in Europe with an experience of over 50 years. The DJI conducts empirical studies into the life situations of children, young people and families, and provides policy advice to the German national government, the German federal states and local authorities as well as key impulses for professional practice.

Founded in 1963, the governing body of the institute is a non-profit association with members from the fields of politics and science as well as from child, youth and family welfare institutions and organisations. The DJI receives the majority of its funding from the Federal Ministry for Family Affairs, Senior Citizens, Women and Youth, and the German federal states. The Federal Ministry of Education and Research, the European Commission as well as foundations and other science funding institutions provide additional funding.

Currently, about 470 staff members work and conduct research at the two locations in Munich and Halle (Saale).

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# 1. Preface

The ‘ERiK Methodological Report II’ (in German: ERiK-Methodenbericht II) is the second methodological report in the study ‘An indicator-based monitoring of structural quality in the German early childhood education and care system’ (in German: Entwicklung von Rahmenbedingungen in der Kindertagesbetreuung – indikatorengestützte Qualitätsbeobachtung – ERiK). While the ‘ERiK Methodological Report I’ (Schacht et al. 2021b) included a detailed discussion of the target population and sampling strategies of the ERiK-Surveys 2020, this report introduces the implementation of the sample and survey designs, evaluates the data quality and introduces the datasets of the ERiK-Surveys 2020. In this respect, the two methodological reports together contain all the background information on the ERiK-Surveys 2020.

The ‘ERiK Methodological Report II’ was written by four staff members of the ERiK project. However, the information it contains is based on work completed by the entire ERiK team who contributed to the ERiK-Surveys 2020 at the German Youth Institute (in German: Deutsche Jugendinstitut – DJI). Special thanks go to the members of the ERiK steering group, Prof. Bernhard Kalicki, Birgit Riedel and Dr. Nicole Klinkhammer as well as to the ERiK team colleagues who gave us feedback, Dr. Martin Brusic, Janette Buchmann, Dr. Doris Drexler, Dr. Michael Müller, Melina Preuß, Susanne Rahmann, Lisa Ulrich and Felix Wenger.

The monitoring project is also part of an important ongoing dialogue for the further development of the quality of Early Childhood Education and Care (ECEC) in Germany. Therefore, the publication benefits from the manifold discussions with colleagues from department 513 of the Federal Ministry for Family Affairs, Senior Citizens, Women and Youth (in German: Bundesmin-

isterium für Familie, Senioren, Frauen und Jugend – BMFSFJ), from the ministries of the federal states as well as the ERiK expert panel. The exchange with various committees and actors provided important technical input for the report. In addition, we thank Prof. Dr. Christian Aßmann, Dr. Matthias Sand, Prof. Dr. Helmut Küchenhoff, Prof. Dr. Hans-Günther Roßbach and Dr. Heike Wirth for their feedback.

We would also like to thank the two survey institutes for their great commitment in carrying out the ERiK-Surveys 2020, the infas Institute for Applied Social Sciences and the SOKO Institute for Social Research & Communication.

Numerous colleagues at the DJI have also helped in preparing this methodological report through their constructive advice and expertise, namely Prof. Ulrich Pötter, Dr. Gerald Prein and Holger Quellenberg.

We would like to thank Dr. Ludovica Gambaro for her review and critical appraisal of the ‘ERiK Methodological Report II’.

In addition to the professional guidance, the report has benefited from the practical support of many people. Our special thanks go to Nina Kuljian and Theresa Kunz for the important organisational support. In addition, we would like to thank Phoebe Bostan-Engel, Gitta Metzger, Marei Peischl as well as the student assistants in the ERiK team.

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## 2. Introduction

The study ‘An indicator-based monitoring of structural quality in the German early childhood education and care system’ (in German: Entwicklung von Rahmenbedingungen in der Kindertagesbetreuung – indikatorengestützte Qualitätsbeobachtung – ERiK) is a national survey that aims to provide data-based knowledge on the quality of early childhood education and care (ECEC) in Germany. Within the framework of the study, cross-sectional surveys are conducted to cover the multiple stakeholder perspectives of directors and pedagogical staff in child day-care institutions, family day-care workers, youth (welfare) offices, childcare providers, parents of children in day-care as well as their children.

The German Youth Institute (in German: Deutsche Jugendinstitut – DJI) conducted the ERiK-Surveys 2020.<sup>1</sup> with directors and pedagogical staff in child day-care institutions, family day-care workers, youth (welfare) offices and childcare providers in cooperation with two survey institutes.<sup>2</sup> In 2022, renewed cross-sectional surveys of the aforementioned target populations are planned, along with the additional survey of children aged four to six years who are cared for in day-care centres in 2022. The ERiK parent survey is linked to the annual ‘DJI Child-Care Study’ (in German: Kinderbetreuungsstudie – KiBS) (Lippert/Anton/Kuger 2022).

This report introduces the ERiK-Surveys 2020 and focuses on the following three aspects of the surveys:

1. Implementation of the sample and survey designs (see Chapter 3),
2. Evaluation of the data quality (see Chapter 4, for a note on *representativeness* see Infobox 2.1) and
3. Introduction of the datasets (see Chapter 5).

To this end, we first describe the field measures, the field processes and the response rates attained based on the datasets of the ERiK-surveys 2020 (Gedon et al. 2021a). The next section evaluates data quality, presents the weighting procedure and assesses the informativeness of the data at federal and state level. It also explicitly compares the distributions of some key variables of the ERiK-Surveys 2020 – weighted and unweighted – with the distributions within official register data. Chapter 5 includes an overview of the data generation process and the resulting datasets. The report concludes with a summary and recommendations for data users. Detailed discussions of the target population and sampling strategies of the ERiK-Surveys 2020 are provided in the ‘ERiK Methodological Report I’ (Schacht et al. 2021b). The survey documents (invitation and reminder letters, data protection information and questionnaires) are integrated in an online appendix to this report (ref. [www.dji.de/erik/MBII\\_Anhang](http://www.dji.de/erik/MBII_Anhang)).

### Infobox 2.1 Representativeness

In public discourse, ‘representativeness’ is often understood as a quality criterion for social science surveys (Gabler/S. Häder 2019). The popularity of the term is likely a result of the fact that the representation inference from samples to the population with calculable selection probabilities is considered a gold standard of survey research.

However, the connection between representation inference and the ‘representativeness’ of the sample remains unclear. No mathematical statistical definition of the term exists. On the contrary, the field knows several definitions (Kruskal/Mosteller 1979a,b,c, 1980) that are ambiguous and/or imprecise (Schnell 2019, p. 163; Schnell/Hill/Esser 2018, pp. 277–279) which has contributed (or led) to instances in which the appraisal of a sample as ‘representative’ is questionable at best (Rendtel/Pötter 1992, p. 28).

<sup>1</sup> We prefer to use the phrase ‘ERiK-Surveys 2020’ for the surveys conducted in 2020, while we speak of the ‘ERiK-Surveys’ when referring to both the ERiK-Surveys 2020 and the ERiK-Surveys 2022. This should also be distinguished from the data publication of the ERiK-Surveys 2020, the citation of which is given at the end of this report in the study synopsis 6.0-2.

<sup>2</sup> The infas Institute for Applied Social Sciences and the SOKO Institute for Social Research & Communication.

This report therefore does not use the term *representativeness* or *representative* to describe the ERiK-Surveys 2020. This does not imply insufficient data quality, but is a result of the decision to avoid an ambiguous term and instead describe methodological considerations in great detail. In the following, the data quality of the ERiK-Surveys 2020 is assessed by

- › focusing on possible sources of error at different stages of the survey process and, in particular, compensation thereof (summarised in the concept of the *Total Survey Error*, Groves 2004);
- › deriving and discussing the necessary sample size for precise and accurate estimates of means and distributions (Borg 2019, p. 144; M. Häder/S. Häder 2014, p. 286; Christians/Wirth 2009).

Therefore, the conclusion is reached that, based on the data generalisable statements about the structural conditions in child day care are possible from different perspectives. It can thus be assumed that the ERiK Surveys 2020 represent an unprecedented foundation for empirical reporting in the German ECEC sector due to their design and with the use of weighting.

### 3. Implementation of the ERIK-Surveys 2020

Implementation of the ERIK-Surveys 2020 included the development of questionnaires and the planning and realisation of targeted field interventions for the respective target populations. Both aspects are described below. The fieldwork and the response rates ultimately achieved are then explained. The chapter concludes with a description of the barriers that prevented potential respondents from participating.

#### 3.1 Questionnaires

The ERIK-Surveys have the main objective of producing data-based knowledge on the quality of early childhood education and care (ECEC) in Germany to accompany the 2018 Federal law on quality development in ECEC (in German: Gesetz zur Weiterentwicklung der Qualität und zur Verbesserung der Teilhabe in Tageseinrichtungen und in der Kindertagespflege, KiTa-Qualitäts- und Teilhabeverbesserungsgesetz (KiQuTG for short); for a brief note on the KiQuTG see Infobox 3.1). The law is targeted at ten qualitative fields of action and on measures to ease the burden of fees on parents. The ERIK questionnaires were developed to elicit information on those same eleven subjects.

**The questionnaires were based on existing instruments and the expertise of ECEC researchers and practitioners**

To do so, a two-pronged approach was pursued. First, the ERIK-Surveys 2020 drew on existing questionnaires in the ECEC field and adopted the relevant questions, which had already been re-analysed for the 'ERiK Research Report I' (the respective studies are summarised in Schacht et al. 2021a). Second, the ERIK team developed new questions, tapping into topics relevant to the KiQuTG, which had not been previously explored. The proportion of newly developed ques-

tions varies between the ERIK-Surveys 2020: 40 % of the questions in the instrument for the directors and 47 % in the instrument for the providers were newly developed. This proportion is 67 % for the survey of pedagogical staff and 54 % for the family day-care workers. The highest proportion of newly developed questions, 73 %, is in the survey instrument for the youth welfare offices. Consequently, the five questionnaires enable the reporting of empirical information for the ten qualitative fields of action and measures to ease the burden of fees on families as defined by the KiQuTG as shown in Klinkhammer et al. (2021b). In addition, the questionnaires include several standard sociodemographic questions (e.g. gender, age, education and migration background), which are, for example, introduced in Hoffmeyer-Zlotnik/Warner (2014).

The questionnaires were developed in close consultation with experts from the field and were adapted when these experts identified problematic wording, filtering or other potential problems ('informal methods' Campanelli 2009, p. 178). Cognitive pretests (as defined in e.g. M. Häder 2010) were conducted in early January 2020 for most of the surveys and in March 2020 for the provider survey. The results led to a final round of revisions of the ERIK questionnaires. The questionnaires were then programmed for online surveys and adjusted for the paper questionnaire delivery by the two survey institutes. A unimode design (e.g. Vannette/Krosnick 2018, 54f) was used across the two survey modes to minimise any mode differences and thus mode effects.<sup>3</sup> As the start of the COVID-19 pandemic coincided with the origin-

<sup>3</sup> In the ERIK-Surveys 2020 of directors and pedagogical staff, soft reminders were implemented in the online questionnaires. In addition, for some crucial questions (e.g. filter variables or variables necessary for weighting), answers in the online survey were mandatory. In the ERIK-Surveys 2020 of family day-care workers, youth welfare offices and providers, soft reminders were implemented in the online questionnaire for selected questions (e.g. filter variables or variables necessary for weighting). No soft reminders or mandatory answers were used in the paper questionnaires.

ally planned field start, a number of questions specific to the COVID-19 pandemic were added to the questionnaires. A detailed description of the instrument's development is given in Wieschke et al. (2021).

**The questionnaire length varied between 18 pages for pedagogical staff and 33 pages for providers**

Despite the fact that the ERiK research questions address diverse topics, attempts were made to keep the questionnaires as short as possible to avoid the negative effects of substantial length on both response rates and the quality of the responses obtained (e.g. Burchell/Marsh 1992; Eisele et al. 2020). Table 3.1-1 lists several characteristics of the ERiK questionnaires.

The paper questionnaires differ in length, measured in the number of pages, between about 20 pages for pedagogical staff and directors and over 30 pages for the surveys of childcare providers, youth welfare offices and family day-care workers. The total number of questions and the share of questions that allowed for open answers also differed between questionnaires (for the definition of open answers used in the ERiK-Surveys, see e.g. Züll/Menold 2014). For example, the directors survey contains the highest number and share of text-based open answers, while the number of numerical open answers is particularly high in the family day-care workers questionnaire. The proportion of closed questions is the highest in the questionnaire for pedagogical staff.

**The processing times for the five ERiK-Surveys 2020 were too long**

In addition, Table 3.2-1 shows the average time taken to complete the online questionnaires by target population in minutes. This varied from an average of 34 minutes (median of 31 minutes) for pedagogical staff to 114 minutes (median of 81 minutes) for youth welfare offices.<sup>4</sup>

The literature suggests that shortening the questionnaire can increase the response rate (P. J. Edwards et al. 2009). In fact, longer questionnaires may even be associated with bias and errors (Eisele et al. 2020; Galesic/Bosnjak 2009;

Herzog/Bachman 1981; Peytchev/Peytcheva 2017). Therefore, the ERiK team plans to shorten the questionnaires for the ERiK-Surveys 2022.

**Infobox 3.1 Act on the Further Development of the Quality and Participation in Child Care (in German: KiTa-Qualitäts- und -Teilhabeverbesserungsgesetz – KiQuTG)**

On 1 January 2019, the German law on quality development in ECEC (KiQuTG), which is widely known as the 'Good Day-Care Facilities Act' (in German: Gute-KiTa-Gesetz), came into force. In the Act, § 6 Monitoring and Evaluation (German Bundestag 2018) contains the following paragraphs.

- (1) The Federal Ministry for Family Affairs, Senior Citizens, Women and Youth (in German: Bundesministerium für Familie, Senioren, Frauen und Jugend – BMFSFJ) shall conduct qualified monitoring on an annual basis, for the first time in 2020 and for the last time in 2023. The monitoring shall be broken down according to the ten fields of action pursuant to § 2, sentence 1 and measures pursuant to § 2, sentence 2.
- (2) The BMFSFJ publishes an annual monitoring report. This monitoring report comprises 1. a general section on the nationwide observation of the quantitative and qualitative development of the provision of early education, upbringing and care for children up to school entry age in day-care institutions and in family day-care, and 2. the progress reports submitted by the federal states pursuant to § 4 sentence 2 number 3.
- (3) The Federal Government shall evaluate the effectiveness of this Act and report to the German Bundestag on the results of the evaluation for the first time two years after its entry into force. The evaluation report shall include the results of the monitoring pursuant to sections 1 and 2.

The fields of action cover various aspects of quality in childcare and range from the creation of a demand-oriented offer to the improvement of the pedagogical staff-child ratio and the recruitment and securing of qualified pedagogical staff to the qualitative further development of childcare.

<sup>4</sup> Extreme cases with an online processing time of more than 500 minutes are excluded from this analysis.

Table 3.1-1: Questionnaires of the ERiK-Surveys 2020

	DIR		PST		FDW		YWO		PRO	
	no.	%	no.	%	no.	%	no.	%	no.	%
No. of pages paper questionnaire	24	–	18	–	32	–	31	–	33	–
No. of variables according to programming template	428	100	283	100	390	100	302	100	396	100
Closed questions	329	77	265	94	304	78	255	84	329	83
Numerical open questions	78	18	14	5	78	20	43	14	57	14
Text-based open questions	21	5	4	1	8	2	4	1	10	3

Note: Abbreviations: DIR = Directors, PST = Pedagogical Staff, FDW = Family Day-Care Workers, YWO = Youth Welfare Offices, PRO = Childcare Providers.

Source: DJI, ERiK-Surveys 2020

## 3.2 Fieldwork efforts

Beside the questionnaire length, several other field methods and efforts can be used to increase response rates. Since there is an international trend towards declining response rates or, conversely, increasing nonresponse rates (Atrostic et al. 2001; Beullens et al. 2018; Brick/Williams 2013; Leeuw/Heer 2002; Dixon/Tucker 2010; Kreuter 2013; Stedman et al. 2019), these fieldwork efforts are highly relevant.

Some researchers (e.g. Fowler 2002) have turned to web/email-based designs that remain anchored in the random sampling approach (Stedman et al. 2019) to increase response rates. For example, web-based options are increasingly added to postal surveys. Although this approach has received criticism (Medway/Fulton 2012) and is no panacea to declining response rates, it nonetheless allows participants to respond using the mode they prefer (Millar/D. A. Dillman 2011).

There are indications of increased fieldwork efforts leading to higher response rates and particularly to a reduction in noncontact rates (e.g. Vehovar/Beullens 2018). Fieldwork efforts broadly include measures such as the number of contact attempts per case, refusal conversion, the provision of an incentive (any type of incentive: monetary as well as non-monetary, conditional as well as unconditional) and the use of advance letters or brochures.

### Simultaneous invitation to web-based and paper survey modes was mainly used

Following the approach mentioned above, in the ERiK-Surveys 2020 the concurrent mixed mode was mainly used, whereby both web-based and paper survey modes are offered to sample members simultaneously (for more information, see

Section 3.8). Given the paucity of survey methodological research on the target populations of the ERiK-Surveys 2020, we also employed a method test in which a randomly drawn subset of the samples were offered only the web-based option.<sup>5</sup> A detailed evaluation of the method test is still pending.

### Fieldwork efforts were adjusted to the respective target populations

All of the above described as well as additional fieldwork measures were applied in the ERiK-Surveys 2020. The fieldwork efforts were adjusted to the respective target population (for an overview, see Table 3.2-1).

Specifically, we

- › planned to prevent seasonal bias by randomly dividing the samples into two tranches (for more information, see the ‘ERiK Methodological Report I’ (Schacht et al. 2021b) and Section 3.3 of this report);
- › published information on the surveys in professional journals for family day-care workers and staff in child day-care institutions in February 2020 and, for the second tranche (see Section 3.3), in May and July 2020;
- › contacted umbrella organisations of childcare providers to support the response of childcare providers in September 2020;
- › used advance letters or brochures for all target populations;
- › asked the BMFSFJ as well as other institutions for support letters and used them for all target populations;

<sup>5</sup> On request, institutions or persons could complete a paper questionnaire, even if they were part of the online only sample. This was only requested on very few occasions.

Table 3.2-1: **Field Times, Field Efforts and Sample Sizes Achieved for the ERIK-Surveys 2020**

Target population	Directors	Pedagogical Staff	Family Day-Care Workers	Youth Offices	Providers
Field period	April - August	April - August	May - September	May - September	May - September
Implementation of tranches	x	x	–	–	x
Advertising/contact with umbrella organisations	x	x	x	x	x
Advance letter	–	–	–	x	–
Brochures	x	x	x	x - after Participation commitment	x
Contact attempts by post	2	2 (indirect)	2 (post or e-mail)	min. 2	2
Contact attempts by e-mail	-	-	2 (post or e-mail)	aver. 2.6	-
Contact attempts by telephone	aver. 5 if tel. no. available	-	-	aver. 8.8	In context of non-response survey
No. of weeks between primary contact and reminder	6(T1) 4(T2)	indirect: 4(T2)	6(T1) individually	individually	7(T1) 3(T2)
Incentives	x	x	x	–	–
Nonresponse Survey	x	–	–	–	x
Average no. of days between primary contact and participation (S.E.)	34.8 (0.43)	26.3 (0.22)	34.8 (0.60)	26.9 (1.26)	35.1 (0.51)
Aver. online processing time in minutes (S.E.)	55.5 (0.51)	34.4 (0.38)	71.7 (1.34)	114.3 (5.74)	64.5 (1.58)
No. of questionnaires	3915	8833	4384	479	2318
No. of complete questionnaires	3867	8714	3704	381	1902

Notes: Online processing times that were longer than 500 minutes have been excluded for the mean processing times presented here. T1=Tranche 1; T2=Tranche 2

Abbreviations: S.E. = Standard error

Source: DJI, ERIK-Surveys 2020, unweighted data

- › first contacted the youth welfare offices by telephone and e-mail in order to ensure the best possible support in addition to the preliminary postal contact with the respective survey institute;
- › then contacted the other target populations by post or e-mail,
- › sent follow-up reminders preferably by post to the target populations and additionally reminded respondents by telephone and/or e-mail if the necessary contact information was available (see Section 3.4);
- › offered pre-incentives for directors and pedagogical staff and additionally post-incentives

in case of participation by directors, pedagogical staff and family day-care workers with a letter or e-mail of thanks (see Section 3.10);

- › endeavored to convert refusals in the additional nonresponse surveys for directors and childcare providers (see Section 3.11 for more information).

### 3.3 Tranches, Contact Materials and Initial Contacts

To prevent seasonal bias and allow for adjustments, the fieldwork was planned to take place in two phases and the sample was divided into cor-



responding tranches. Therefore, three samples of the ERiK-Surveys 2020 were randomly divided into two tranches, namely the surveys of directors and pedagogical staff in child day-care centres as well as the survey of childcare providers. Approximately 9 % of the directors gross sample and approximately 6 % of the pedagogical staff gross sample was randomly assigned to Tranche 2. In contrast, almost half of the childcare providers gross sample (47 %) was randomly assigned to Tranche 2.

**Three samples of the ERiK-Surveys 2020 were divided into tranches**

This time-lagged approach was not used for the surveys of family day-care workers and youth welfare offices as the COVID-19 pandemic severely delayed the field start, which made this approach unfeasible for these surveys. Ultimately, both of these ERiK-Surveys 2020 started simultaneously (for more information on the original conception and actual implementation of the tranches for all populations, see the ‘ERiK Methodological Report I’ Schacht et al. 2021b).

**Most of the target population was first contacted by post in April and May 2020**

After the publication of information in professional journals for pedagogical staff in child day-care institutions and family day-care workers in February 2020 (or May and July 2020 for the second tranche), the first contact with the target populations was scheduled for March 2020. However, with the outbreak of the COVID-19 pandemic in Germany, the start of fieldwork was postponed from March 2020 to April (for directors and pedagogical staff) or May 2020 (for family day-care workers, youth offices and childcare providers). The delay was used to adapt the questionnaires to the new situation during the first wave of the pandemic (see Wieschke et al. 2021).

**Youth welfare offices were closely monitored by the survey institute**

The details of the contact sequences are shown in Figure 3.3-1. It shows that the contact sequences varied depending on the target population.

We first contacted the target populations of the ERiK-Surveys 2020 in the following manners:

- › Directors and pedagogical staff: The letters of invitation were sent by post together with the questionnaires, prepaid return envelopes for the paper questionnaires<sup>6</sup>, an ERiK information brochure, information on the ERiK data protection rules and a small pre-incentive (see Section 3.10) to the addresses of the day-care centres (for more information on the sampling design of the ERiK-Surveys 2020, see the ‘ERiK Methodological Report I’ Schacht et al. 2021b). If applicable, the initial letters to the directors also included the letters of invitation and the aforementioned contact materials for five members of the pedagogical staff (ibid.). In addition, the initial letters to the directors also included statements of support from the BMFSFJ (not included in the contact material for the pedagogical staff).
- › Youth welfare offices: A ‘soft’ first contact approach, as defined by Don A. Dillman (1991, p. 240), was used for the youth welfare offices. It was only mentioned briefly in the advance letter sent out in March 2020 that a survey was coming up and that we would appreciate the organisation’s participation and, ideally, for them to name a contact person.<sup>7</sup>

The organisation or contact person was then contacted by telephone and e-mail by the survey institute when the necessary contact information was available. Indeed, previous research shows that telephone contacts in postal surveys are as effective as mailings in reducing nonresponse, while improving the contact rate (Nederhof 1988; Don A. Dillman 1991). The youth welfare offices were contacted an average of ten times in this first round of contacts (ranging from min. 1 to max. 30 contact attempts), with an average of 2 e-mails sent (ranging from min. 0 to max. 9 e-mails) and an average of 8 calls made (ranging from min. 0 to max. 28 calls).

After the youth welfare offices had agreed that they would like to receive the contact materials, the initial letters including the questionnaire (paper with a web option or only the web option, see Section 3.1), prepaid return

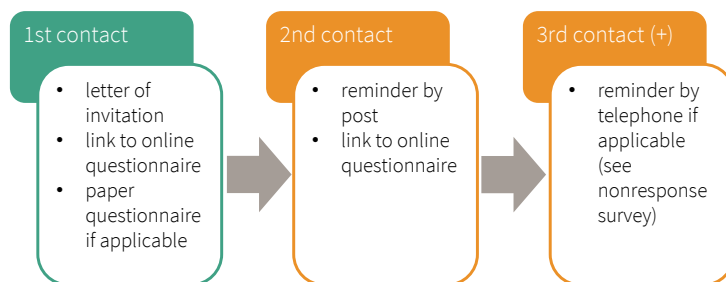
<sup>6</sup> The questionnaires and return envelopes were not included if the day-care centre was part of the online only sample.

<sup>7</sup> These were interrupted on 18 March due to the COVID-19 pandemic and resumed with the contacting of the second tranche in May 2020. In a few cases, therefore, the youth welfare offices could have already participated before the postponed start of the field phase.

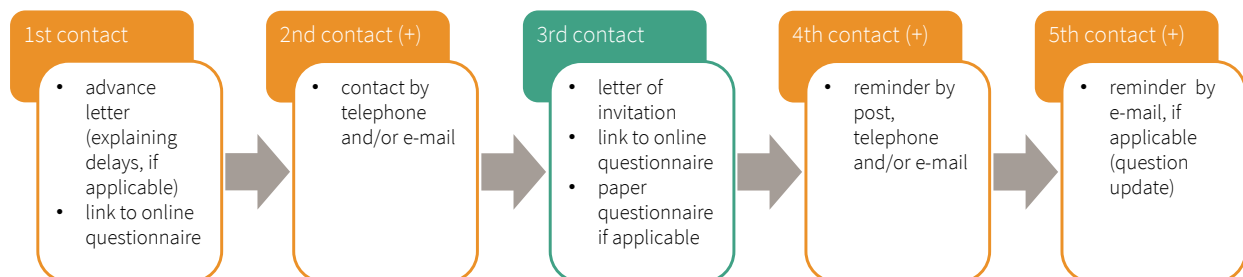


Figure 3.3-1: **Contact Sequences and Reminders of the ERiK-Surveys 2020**

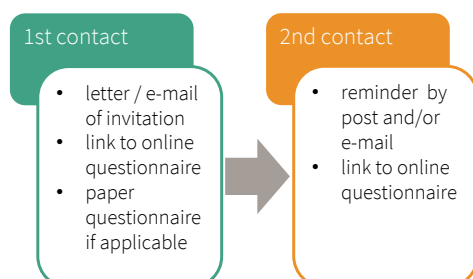
Contact Sequence: Directors and Pedagogical Staff



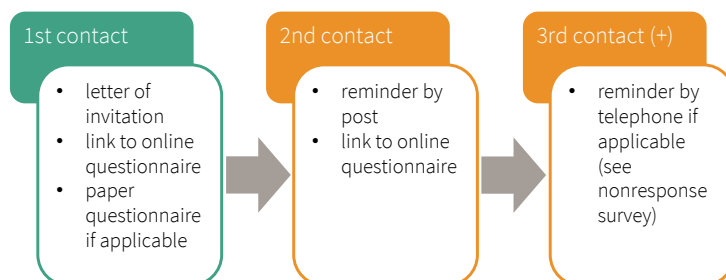
“Soft” Contact Sequence: Youth Welfare Offices



Contact Sequence: Family Day-Care Workers



Contact Sequence: Childcare Providers



Legend

Letter of invitation

Other contact attempt(s)

envelopes for the paper questionnaires, an ERiK information brochure, information on the ERiK data protection rules and accompanying letters from the BMFSFJ and the Federal Association of Central Municipal Organisations (in German: Bundesvereinigung der kommunalen Spitzenverbände – BVkom), were sent out by post and / or e-mail. As already mentioned, the contact materials also contained the contact materials that the youth welfare offices

should forward to the family day-care workers if applicable (for more information on the sampling design of the ERiK-Surveys 2020, see the ‘ERiK Methodological Report I’ Schacht et al. 2021b).

- Family day-care workers: The initial letters to the family day-care workers were (mostly) sent by post by the cooperating youth welfare offices. The letters of invitation contained the questionnaire (paper with a web option or only

the web option, see Section 3.1), prepaid return envelopes for the paper questionnaires, an ERiK information brochure, information on the ERiK data protection rules and the aforementioned accompanying letters (BMFSFJ and BVkom). In cases where it was not possible for the youth welfare office to send the study materials by post, the youth welfare office was asked to send the study materials digitally, i.e. via an e-mail distribution list. In these cases, the family day-care workers were only given access to the web option for the questionnaire.

- › Childcare providers: The initial letters to the providers informed them about the study and invited the providers to participate in the study as an organisation. The initial letters contained the questionnaire (paper with a web option or only the web option, see Section 3.1), prepaid return envelopes for the paper questionnaires, an ERiK information brochure, information on the ERiK data protection rules and a letter of legitimisation from the BMFSFJ and the Federal Association of Non-statutory Welfare (in German: Bundesarbeitsgemeinschaft der Freien Wohlfahrtspflege e.V. – BAGFW).

In summary, it can be said that the initial contact with the ERiK target populations was mainly made via the invitation letter including the questionnaire. The only exception was the youth welfare offices, which were contacted in advance by post, but also by telephone and e-mail, provided that the survey institute had their telephone number or e-mail address before receiving the invitation letter including the questionnaire.

## 3.4 Reminders

**At least two contact attempts were made in each sample**

Even though more contact attempts including reminders increase the survey costs, many survey methodology researchers see this as a reliable means of increasing response rates (Smith 2007; Romanov/Nir 2010; Fuchs/Bossert/Stukowski 2013) and reducing nonresponse bias. However, other studies come to the opposite conclusion, (e.g. Heerwegh/Abts/Loosveldt 2007; Kreuter/G. Müller/Trappmann 2010). Among other efforts, an increased number of contact attempts including reminders was used in the ERiK-Surveys 2020

(see Figure 3.3-1) in order to achieve higher response rates. Each sampled institution or person was contacted at least twice (including the invitation letter). Some studies show that response rates stabilise after six to seven contact attempts (Safir/Tan 2009; Fuchs/Bossert/Stukowski 2013). In this respect, the average number of contact attempts in the ERiK-Surveys 2020 can be classified as high for the youth welfare offices and as low for the other target populations of the ERiK-Surveys 2020.

**Target populations were reminded to participate mainly with reminder letters**

In the ERiK-Surveys 2020, the reminders were sent to the target populations mainly by post or, in the case of some of the family day-care workers, by e-mail, as this was the contact mode preferred by the youth offices.

The directors received reminder letters four or six weeks after the invitation letter, depending on which tranche they were assigned to. These reminders also included the reminders for the pedagogical staff, if applicable. The directors were also contacted once by telephone (if the telephone number was available) to ask them to complete the questionnaire and to forward the invitations to the pedagogical staff. This mirrors the approach taken for the youth welfare offices and is in line with an approach suggested in the literature (Nederhof 1988; Don A. Dillman 1991). As part of this contact, the directors were asked to participate in an immediate short nonresponse interview if they refused to complete the main survey (see Section 3.11).

After the letter of invitations, the youth welfare offices were reminded by post as well as by telephone and by e-mail if the corresponding contact data was available. The 532 youth welfare offices where no or only partial questionnaires (see Infobox 3.2) were available or where less than 40 % of the contacted family day-care workers had participated were reminded by post. In addition, an average of 1.0 e-mails (min. 0; max. 5) were sent and 3.2 (min. 0; max. 25) telephone calls were made to the youth welfare offices during this reminder phase.<sup>8</sup> The postal reminders also

<sup>8</sup> The survey institute states that some contacts could not be logged, so the actual number of contact attempts may be underestimated.

included the reminders for the family day-care workers, if applicable. If the youth welfare offices still had not participated after a few weeks, a final reminder was sent by e-mail.

For the ERiK-Survey 2020 of providers, the reminder letter was sent seven weeks after the invitation letter in Tranche 1 and three weeks after the first invitation in Tranche 2. Refusals or no-contacts were additionally contacted in the providers nonresponse survey by telephone (see Section 3.11 for more information), provided that the corresponding contact information was available.

Finally, after completion of the ERiK-Surveys 2020 at the individual level, namely the surveys of directors, pedagogical staff and family day-care workers, thank-you letters for participating in the surveys were sent by post. The thank-you letters also contained a post-incentive, if applicable (for more information, see Section 3.10).

### 3.5 Fieldwork Evolution

Figures 3.5-1, 3.5-2 and 3.5-3 show the weekly number of questionnaires completed in 2020 separately for the target populations. The progress of the fieldwork was monitored to intervene so as to enhance the process and data quality with a fixed budget (Vandenplas 2017). The timing of the interventions applied are also shown in the figures, namely the starts of the second tranches and the sending of reminders.

**Directors and pedagogical staff mostly answered the questionnaires in the first two months of fieldwork**

Specifically, Figure 3.5-1 shows that the first questionnaires were filled out by the directors and pedagogical staff shortly after the fieldwork started at the end of April. The largest proportion of completed questionnaires were answered by pedagogical staff and directors within the first two months of the survey. The sending of the reminder letters at the beginning of June seems to have had a positive impact on the number of completed questionnaires.

For Tranche 1, about 23 % of the directors' questionnaires and about 7 % of the pedagogical staff questionnaires were answered after the telephone reminders, which took place between 27 June 2020 and 7 August 2020 (see Section 3.11).

In the last two months of fieldwork, the number of completed questionnaires increased mainly because the second tranche also went into the field. In general, the low response rate in these months could be related to possible closures of day-care centres during the 2020 summer holidays between 22 June and 12 September.<sup>9</sup>

**Youth welfare offices and family day-care workers rarely answered the questionnaires in the first two months of fieldwork**

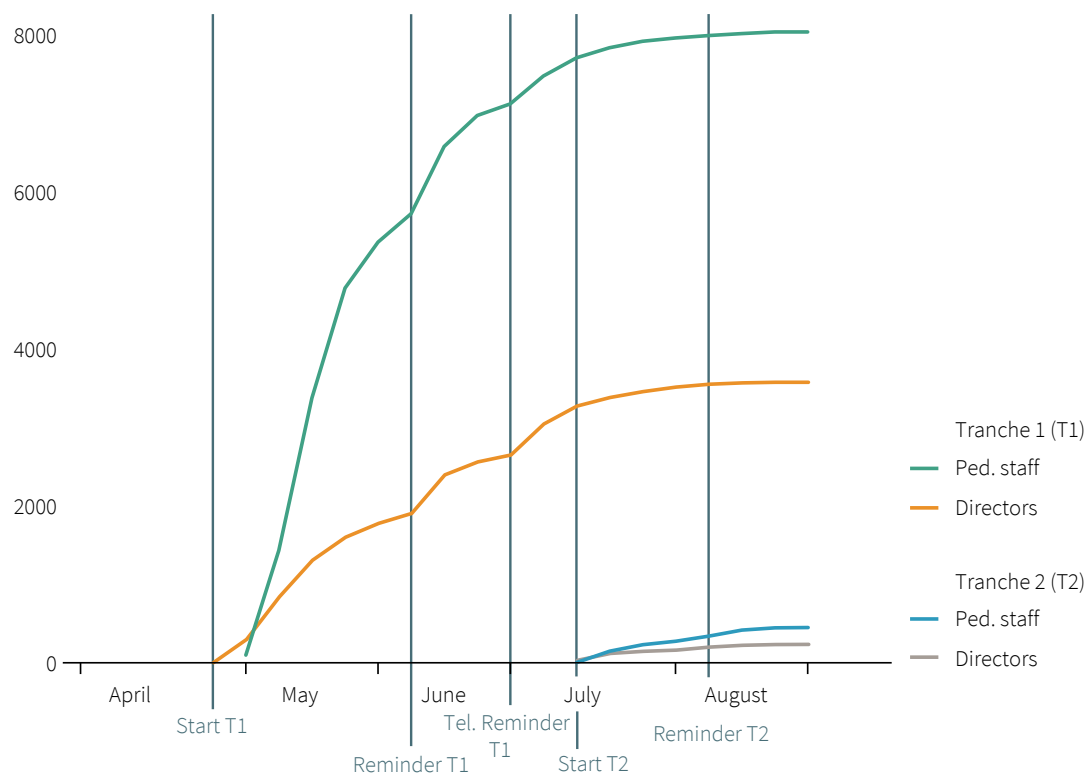
In contrast to the response behaviour in the surveys of directors and pedagogical staff, hardly any questionnaires were filled out in the ERiK-Surveys 2020 of youth welfare offices and family day-care workers in the first two months (see Figure 3.5-2). As of the end of June, the case numbers for both surveys increased steadily over the course of July and August 2020. After the start of the reminder contacts, about one third of the completed questionnaires were answered by youth offices. In case of the family day-care workers, the majority of questionnaires were handed in after this date. Only comparatively few cases were realised in September and October 2020. Again, the low response rate in these months could be related to possible holidays of family day-care workers during the 2020 summer holidays between 22 June and 12 September and their aftermath.

In contrast to the ERiK-Nonresponse-Survey 2020 of directors, the telephone reminders within the ERiK-Nonresponse-Survey 2020 of providers which were carried out between 1 and 30 September 2020 did little to increase participation (see Section 3.11).

**Childcare providers answered the questionnaires in the first two months after the preliminary contact**

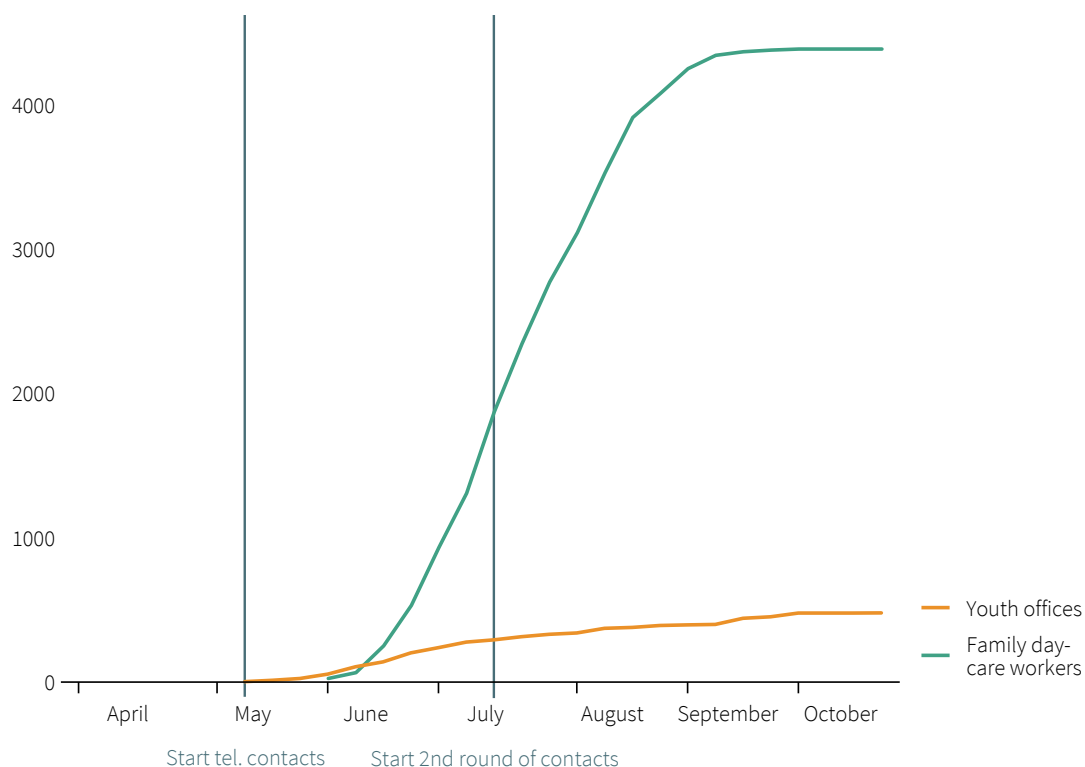
Figure 3.5-3 shows the field development for the ERiK-Survey 2020 of childcare providers. The survey institute sent the initial letters to Tranche 1 on 14 May 2020 (about 3900 questionnaires) and 15 May 2020 (about 390 questionnaires) and to Tranche 2 on 15 July 2020 (about 160 questionnaires) and 22 July 2020 (about 6900 questionnaires).

<sup>9</sup> During this period, there are about six weeks of school holidays in each federal state. However, the start date varies in each.

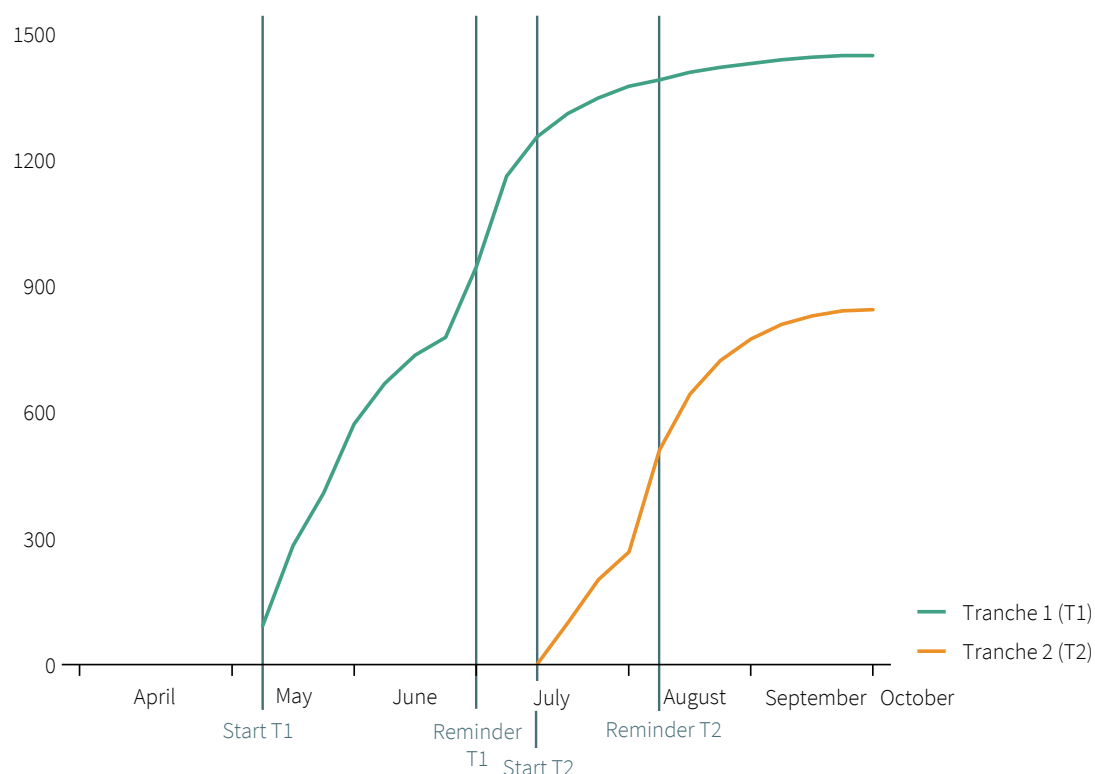
Figure 3.5-1: **Weekly Number of (Partially) Completed Questionnaires: Directors and Pedagogical Staff**

Note: Questionnaires for which no survey date is available are not shown (59 directors and 231 ped. staff).

Source: DJI, ERIK-Surveys 2020: Survey of Directors, unweighted data, n=3808; DJI, ERIK-Surveys 2020: Survey of Pedagogical Staff, unweighted data, n=8483

Figure 3.5-2: **Weekly Number of (Partially) Completed Questionnaires: Youth Welfare Offices and Family Day-Care Workers**

Source: DJI, ERIK-Surveys 2020: Survey of Youth Welfare Offices, unweighted data, n=479; DJI, ERIK-Surveys 2020: Survey of Family Day-Care Workers, unweighted data, n=4384

Figure 3.5-3: **Weekly Number of (Partially) Completed Questionnaires: Childcare Providers**

Note: 26 questionnaires for which no survey date is available are not shown.

Source: DJI, ERiK-Surveys 2020: Survey of Providers of Childcare, unweighted data, n=2292

naires) by post. In the first two months, the number of completed questionnaires rose steadily. The sending of the reminder letters at the beginning of July also seems to have had a positive effect on participation behaviour in this ERiK-Survey 2020.

After the start of the second tranche in mid-July, the number of cases rose continuously – analogous to Tranche 1 – and seems to have been increased again by the reminders at the beginning of August. In September, hardly any questionnaires were completed in the first and second tranche of the childcare provider survey.

In contrast to the other ERiK-Surveys 2020, the effect of the summer holidays does not seem to be evident in Tranche 2, although it cannot be ruled out that the response rate would have been higher if the tranche had not gone into the field during the 2020 summer holidays.

### 3.6 Number of Completed Questionnaires and Length of Fieldwork Period

**In total, about 19,000 institutions or persons took part in the ERiK-Surveys 2020**

In total, about 3,900 directors, 8,700 pedagogical staff, 3,700 family day-care workers, 380 youth welfare offices and 1,900 childcare providers handed in complete questionnaires (see Table 3.2-1; for more information on the differentiation between complete and partial questionnaires, see Infobox 3.2).

#### Infobox 3.2 Complete Questionnaires in the ERiK-Surveys 2020

A questionnaire is defined as complete rather than partial if the variables necessary for weighting the ERiK-Surveys 2020 (see Table 4.2-1) are not missing and at least one of the following conditions applies:

1. A paper questionnaire has been returned to the survey institute (regardless of how many questions have been answered).
2. In the online instrument of directors and pedagogical staff: The respondent actively submitted the online questionnaire (i.e. clicked on the respective button).
3. In the online questionnaire of family day-care workers and providers, the last screen was accessed.
4. In the online questionnaire of youth offices: The last screen in all eight modules was accessed.
5. In the case of directors, pedagogical staff and family day-care workers: One of the last ten questions before the sociodemographics was answered.
6. In the case of youth office and providers: At least 90 % of the first module (respectively the module in which the variables required for weighting are asked) is available.

These differing definitions were chosen in anticipation that they would best reflect the specifics of the respective target populations. They therefore also deviate from the definition by the American Association for Public Opinion Research (AAPOR) (American Association for Public Opinion Research 2016, 36ff) for complete (AAPOR code 1.1) and partial (AAPOR code 1.2) questionnaires.

Due to delays associated with the COVID-19 pandemic, the field end was postponed until August (for directors and pedagogical staff) and September 2020 (for family day-care workers, youth offices and childcare providers; see Table 3.2-1).

**The time span between initial contact and participation was shortest for pedagogical staff and longest for directors and family day-care workers**

There were strong differences between the survey populations and survey modes regarding the length of the fieldwork period, starting with the initial contact (advance letter for youth welfare offices and the letter of invitation for the other target populations, see Section 3.4) and ending with the participation of the survey populations.<sup>10</sup>

<sup>10</sup> Only for the institutions or persons who completed a questionnaire in one of the ERIK-Surveys 2020.

On average, pedagogical staff participated in the ERIK-Surveys 2020 26 days after the (expected<sup>11</sup>) initial contact, while family day-care workers participated on average only after about 35 days following the (expected) initial contact.

**Responses to the web questionnaire option tended to take place earlier than those to the paper option**

With the exception of the ERIK-Survey 2020 of family day-care workers, the time span between the initial contact and the participation was significantly shorter for all survey populations if the participating institutions or individuals opted for the web option instead of the paper version. The average time span between the initial contact and participation was particularly long for the youth welfare offices that participated by paper questionnaire. Graph 3.6-1 shows the corresponding mean values and medians in detail.

### 3.7 Response Rates

Response rates in surveys generally indicate the ratio between the responding and nonresponding but eligible units of observation (Vehovar/Beulens 2018). Although they are often seen as an indicator of the quality of a survey, there seems to be a trend towards decreasing response rates in many countries, including Germany (ibid.).

There are several ways to calculate the response rate of a survey. The American Association for Public Opinion Research (AAPOR) has established six standard definitions (American Association for Public Opinion Research 2016), the calculation of which can lead to very different response rates.

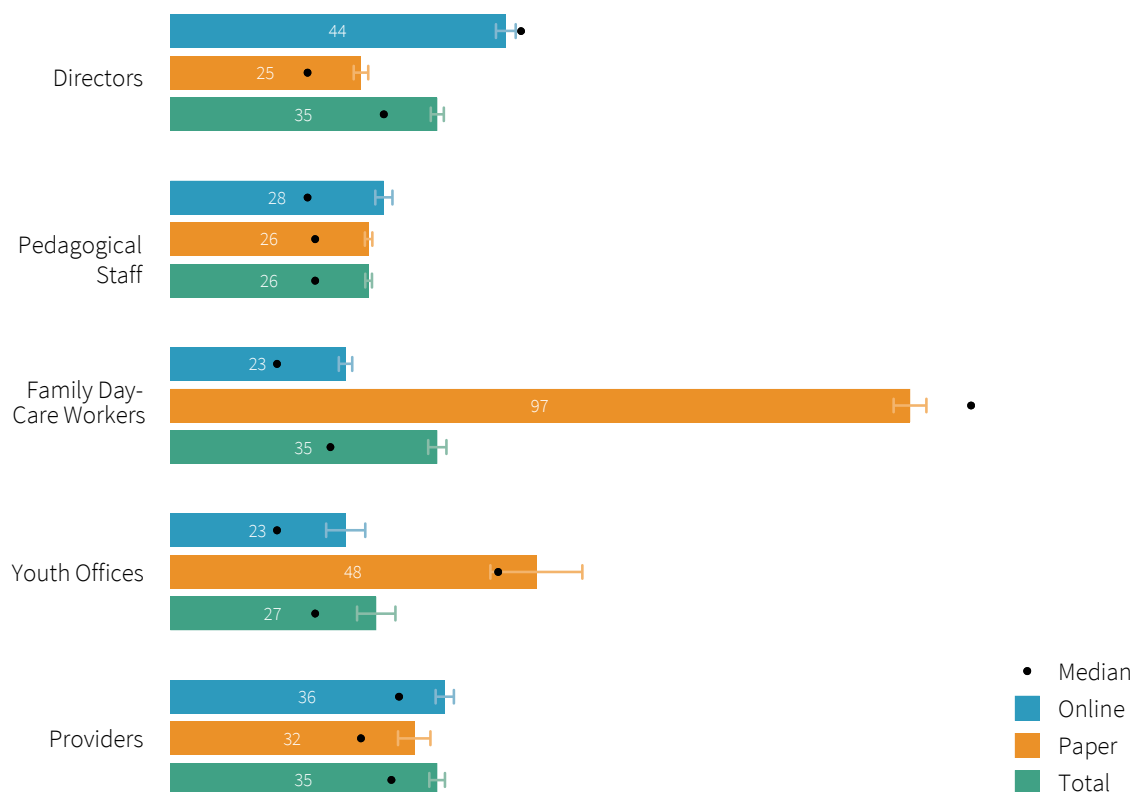
**Response rates calculated on the basis of AAPOR Definition number 2**

We used the AAPOR response rate definition number 2 (ibid.) when calculating the response rates, as it paints a more conservative picture than the other types of calculation. This is the case because it is not influenced by the unknown proportion of eligible cases in the 'eligibility unknown' category of our samples (S. Häder/M. Häder/Schmich 2019, 310ff; American Association for

<sup>11</sup> 'Expected', indicates that it is unclear whether the youth welfare offices and directors have forwarded the contact materials to the family day-care workers and the pedagogical staff.



Figure 3.6-1: Average Duration from Primary Contact to Participation (in days)



Source: DJI, ERiK-Surveys 2020, unweighted data

Public Opinion Research 2016, 61f). Instead, it is assumed that all cases in this category are eligible for the calculation of the response rate (S. Häder/M. Häder/Schmich 2019, 310ff; American Association for Public Opinion Research 2016, 61f). Furthermore, we decided to include partial cases, as these can still provide valid information (especially in the case of youth welfare offices), e.g. in regression analyses where no weighting is applied or when missing data is (multiply) imputed (for a discussion of regression analysis and weighting, see e.g. Gelman 2007; Pfeffermann 1993).

#### Particularly high response rate for youth welfare offices

Figure 3.7-1 shows the response rates for the ERiK-Surveys 2020 according to the AAPOR definition number 2 (for an adaptation to the German context, see Stadtmüller et al. 2019). The response rates are very different in the five ERiK-Surveys 2020: 16 % for childcare providers, 19 % for pedagogical staff, 20 % for family day-care workers, 33 % for directors and 83 % for youth welfare offices.

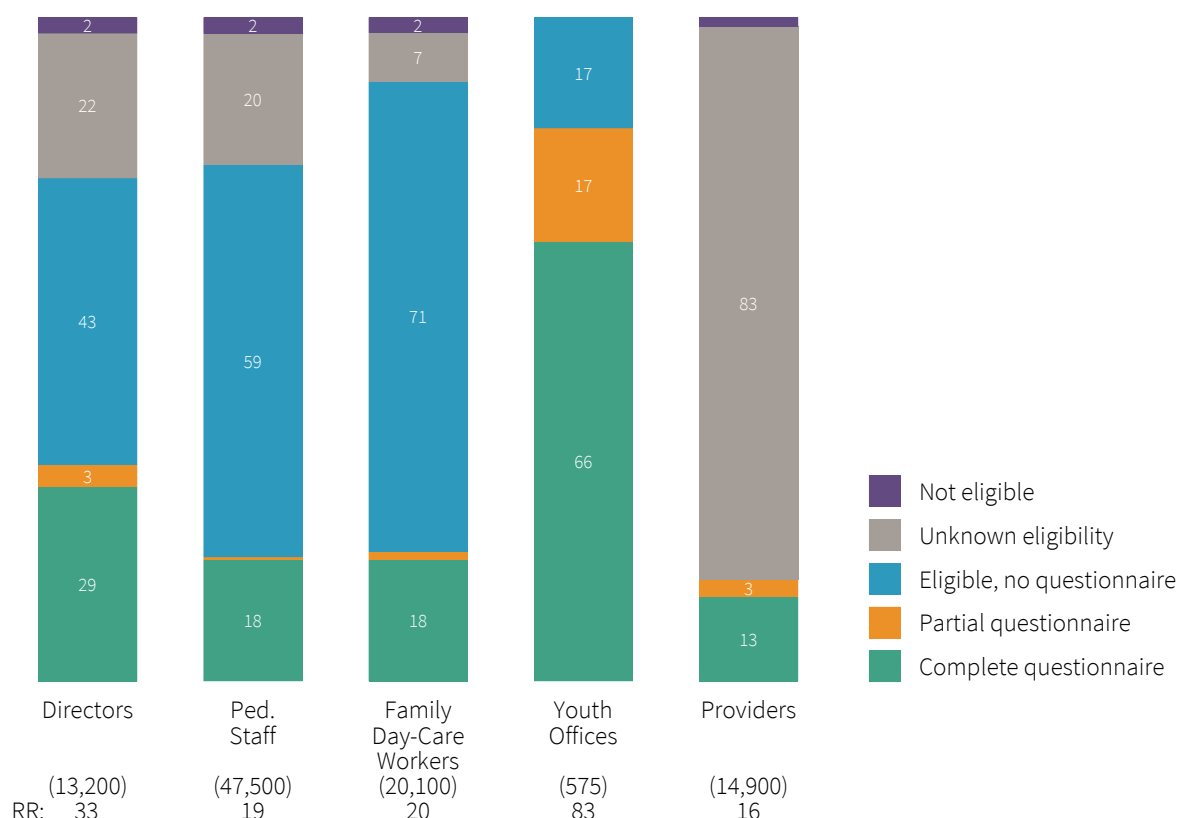
Compared to previous surveys of the target populations, the response rates of the ERiK-Surveys 2020 were higher for youth welfare offices (previous studies: 54 %), but lower for the surveys of directors (42 %), pedagogical staff (42 %), family day-care workers (28 %) and childcare providers (33 %) (cf. Schacht et al. 2021b). However, it is possible that the COVID-19 pandemic in 2020 negatively affected participation in the surveys (Sakshaug et al. 2020).

The more frequent partially completed questionnaires in the youth welfare office survey (17 %) compared to the other ERiK-Surveys 2020 are striking. This could be partly due to the different definitions of complete and partial questionnaires in the ERiK-Surveys 2020 (for more information, see Infobox 3.2).

#### Unknown eligibility particularly high among childcare providers

Also noteworthy is the prevalence of unknown eligibility (AAPOR code 3.0) among directors (22 %) and especially among childcare providers (83 %). This code was assigned when no contact could

Figure 3.7-1: AAPOR Codes and Response Rates (RR) for the ERiK-Surveys 2020



Note: Rounded gross samples in parentheses; RR = Response Rates.

Source: DJI, ERiK-Surveys 2020, unweighted data

be made with the respective centre or provider to confirm its existence or eligibility. This high proportion of unknown eligibility in these two survey populations is likely due to the fact that the commercially acquired address lists are of relatively low quality and include outdated entries.

If the eligibility of the day-care centres/directors is unknown (AAPOR code 3.0), the eligibility of the centre's pedagogical staff is also defined as unknown. However, if the day-care centre/director is eligible but did not complete a questionnaire (AAPOR code 2.0), the pedagogical staff of these centres are defined as eligible.<sup>12</sup>

For family day-care workers, eligibility was coded as unknown (AAPOR code 3.0) if the respective youth welfare office should have distributed questionnaires but did not respond and no family day-care workers from the youth welfare office district participated. For these cases, it can be assumed that the respective youth welfare office did not forward any questionnaires to family day-care workers.

#### Sampling frame of the youth welfare offices rated as particularly good

On the other hand, none of the youth welfare offices were classified with the category 'eligibility unknown' (AAPOR 3.0) since the sampling frame for this target population is considered up-to-date and its quality is much higher than that of the commercially acquired lists for centres and childcare providers (see Schacht et al. 2021b).

In summary, the response rates of the ERiK-Surveys 2020 were lower than in previous surveys, with the exception for youth welfare offices.

12 We also reduced the gross sample of pedagogical staff in cases where we were told by the directors that the centre had fewer than the five pedagogical staff to whom they were supposed to distribute the questionnaires; unless more staff participated than the centre director indicated would be employed in the day-care centre. In this case, the director's response was not taken into account and the five pedagogical staff members were left with the original coding. This leads to a reduction in the gross sample from the 48,000 pedagogical staff questionnaires reported in the ERiK Methodological Report I (Schacht et al. 2021b) to the 47,500 questionnaires given here.



Among directors, pedagogical staff and family day-care workers, this is probably due to a lower willingness to participate in the surveys during the COVID-19 pandemic period. In the case of childcare providers, due to the lack of registers or other reliable sampling frames of the childcare providers, no further statements on eligibility to participate are possible.

### 3.8 Mode Preferences

As previously mentioned, the concurrent mixed mode was mainly used in the ERiK-Surveys 2020, whereby both web and paper survey modes are offered to sample members simultaneously. In addition, ERiK offered a subset of the samples only the web option (for more information on the method test, see Schacht et al. 2021b).

#### ERiK target populations preferred different survey modes in 2020 (in the concurrent mixed mode)

For the directors, pedagogical staff and youth welfare offices, these samples were rather small (see Table 3.8-1), while in the surveys of childcare providers and of family day-care workers, about half of the sample was offered only the web option. In these cases, the survey institutes offered the web mode during the preliminary contact, but were also allowed to offer the postal survey mode during a later contact attempt ('sequential' mixed mode, see e.g. Medway/Fulton 2012) if the institutions or persons asked for a paper questionnaire, which rarely occurred.

Table 3.8-1 indicates that the different ERiK target populations preferred different survey modes in 2020 when given the choice between web and postal survey participation (concurrent mixed mode). 87 % of the pedagogical staff used the paper questionnaire instead of participating via the web option. Family day-care workers and directors also preferred the paper questionnaires for participation (76 % and 52 %). In contrast, 82 % of the youth welfare offices and 59 % of the childcare providers participated via the web option in the concurrent mixed mode.

#### Providing a concurrent mixed mode increased response rates to the ERiK-Surveys 2020

In addition, providing a concurrent mixed mode as opposed to providing only the web option resulted in a higher response rate. On average, the response rate was 16 % higher in the case of a concurrent mixed mode for the ERiK-Surveys 2020 (a detailed analysis of the method test is still pending; for more information on the design of the method test see Schacht et al. 2021b). As in corresponding methodological studies (Medway/Fulton 2012), simultaneous mixed modes also seem to increase response rates for the target populations of the ERiK-Surveys 2020.

Furthermore, Table 3.8-1 shows that only three family day-care workers and five providers of childcare requested a paper questionnaire when only a web option was initially offered.

Table 3.8-1: Questionnaires by Survey Modes

	DIR		PST		FDW		YWO		PRO	
	Online	Paper	Online	Paper	Online	Paper	Online	Paper	Online	Paper
Online link only	210	0	445	0	1325	3	35	0	924	5
Online link and paper questionnaire	1767	1938	1116	7272	746	2308	365	79	814	575
Mode choices if only online was initially offered (in %)	100	0	100	0	100	0	100	0	99	1
Mode choices if both modes were initially offered (in %)	48	52	13	87	24	76	82	18	59	41

Note: Including partial and complete questionnaires. Abbreviations: DIR = Directors, PST = Pedagogical Staff, FDW = Family Day-Care Workers, YWO = Youth Welfare Offices, PRO = Providers.

Source: DJI, ERiK-Surveys 2020, unweighted data

### 3.9 Regional Coverage

Some studies assess survey quality by their regional coverage (e.g. Franceschi et al. 2021). Figures 3.9-1 and 3.9-2 show the regional coverage of the ERiK-Surveys 2020 in Germany. It should be noted, however, that the main focus of the ERiK-Surveys 2020 is not to be able to monitor differences at the district level<sup>13</sup> in Germany. The population sizes in the German districts would not be sufficient for this (for more information on sample sizes and explanatory power at regional level for the ERiK-Surveys 2020, see Section 4.3).

At the same time, the sample design<sup>14</sup> did not provide for comprehensive coverage of all districts in Germany, i.e. in some districts, no attempt was made to survey the target populations. Figures 3.9-1 and 3.9-2 nonetheless provide a first overview of the regional composition of the ERiK-Surveys 2020.

**In four out of five surveys, participation in Germany was relatively evenly distributed across administrative districts**

The colour gradations in Figure 3.9-1 represent the proportion of complete and partial<sup>15</sup> questionnaires in each population according to official register data (child and youth welfare statistics, KJH statistics<sup>16</sup> for short; Federal Statistical Office 2020) or, in the case of the provider survey, with the sampling frame at district level. The colour gradations are set as follows: no participation is indicated with white<sup>17</sup>, the lowest 10 % of the districts are marked with the lightest colour. Further gradations are 25 %, 50 %, 75 % and 90 % of the

districts. The top 10 % of the districts are thus marked with the darkest colour. These percentile cutoffs are used because the maximum proportion of a district population that participates varies greatly over the surveys (e.g. 75 % for providers vs. 0.7 % for pedagogical staff). Therefore, it is not feasible to use the same participation percentages for the categorisation of all surveys.

Directors and pedagogical staff of almost all districts and independent cities took part in the respective survey. In fact, in only four districts and independent cities did no directors or pedagogical staff take part. In the north-western and southern parts of Germany, the proportion of participants in the population is somewhat lower compared to the other regions.

In only 16 districts or independent cities in Germany, no providers participated in the survey. In 38 % of the districts and independent cities in Germany no family day-care workers participated. Since not every youth office was asked to forward questionnaires to family day-care workers, in 25 % of all districts and independent cities, they were simply not sampled.

The colour gradations in Figure 3.9-2 represent whether a youth welfare office participated (at least partially) in the survey at district level. In some districts and independent cities, the youth welfare offices did not participate. As the map shows, there is no clear pattern in which regions youth welfare offices tended not to respond. The youth welfare offices that participated in the ERiK-Surveys 2020 are more or less evenly distributed across Germany. In 15 % of the districts and independent cities, no youth office responded to the survey.

Overall, the maps show that the districts were covered by at least one survey, but usually by several. Of the 401 existing districts, questionnaires from all surveys are available for 55 % (220) of the districts. In 30 % (122) of the districts, only data from one survey is missing – data from four surveys are thus available. In 13 % (51) of the districts, data from two surveys are missing. In the last 2 % (8) of the districts, questionnaires from only one or two surveys are available.

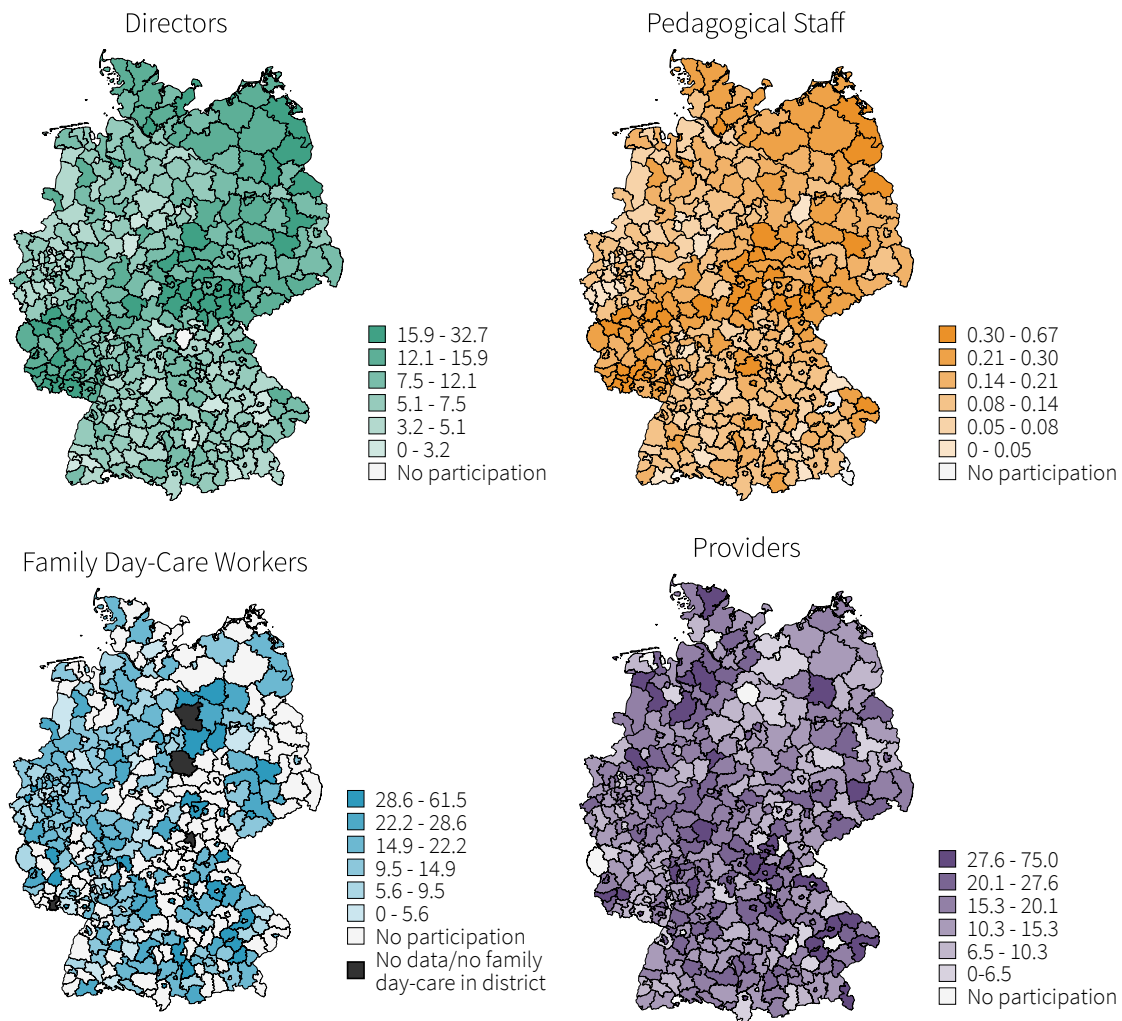
13 Germany is divided into 401 administrative districts. These districts consist of 294 rural districts (in German: 'Kreise' and 'Landkreise') and 107 urban districts (in German: 'Kreisfreie Städte' and 'Stadtkreise', the latter being towns or cities that constitute districts in their own right) (European Commission 2021; Federal Statistical Office 2019).

14 Detailed discussions of the target population and sampling strategies of the ERiK-Surveys 2020 are provided in the ERiK Methodological Report I (Schacht et al. 2021b).

15 For more information on the differentiation between complete and partial questionnaires in the ERiK-Surveys 2020, see Infobox 3.2.

16 The KJH statistics include: 1. data on various forms of educational assistance and administrative tasks of the youth welfare offices, 2. data on youth work measures of public and independent providers, 3. data on child-care in various youth welfare facilities and the persons working there as well as on publicly funded family day-care for children, 4. data on the expenditure and income for child and youth welfare (Research Data Centre of the Statistical Offices of the Federal States 2022).

17 The district is also marked white, if no person or institution was sampled in the respective district.

Figure 3.9-1: **Proportion of Questionnaires in each Population Size at District Level (in %)**

Note: Including partial and complete questionnaires; population sizes according to the KJH statistics 2020 (directors, ped. staff, family day-care workers) or the sampling frames (childcare providers) on district level. The boundaries of the categories are derived from percentiles of the distribution of the proportions. Rounded values are given in the legend for better readability.

Source: DJI, ERIK-Surveys 2020: Survey of Directors, n=4302; Survey of Pedagogical Staff, n=8890; Survey of Family Day-Care Workers, n=4384; Survey of Childcare Providers, n=2288; Research Data Centre of the Statistical Offices of the Federal States, Statistik der Kinder- und Jugendhilfe, Kinder und tätige Personen in Tageseinrichtungen und in öffentlich geförderter Kindertagespflege, 2020; commercially acquired address lists of childcare providers 2020; unweighted data

### 3.10 Incentives

Using monetary incentives increases response rates compared to no incentive (Church 1993; P. J. Edwards et al. 2009; Olson et al. 2021). Many studies have shown that a small amount of money (e.g. £5 or \$1) already has a significant effect on response rates (Chan et al. 2003; C. Ulrich et al. 2005).

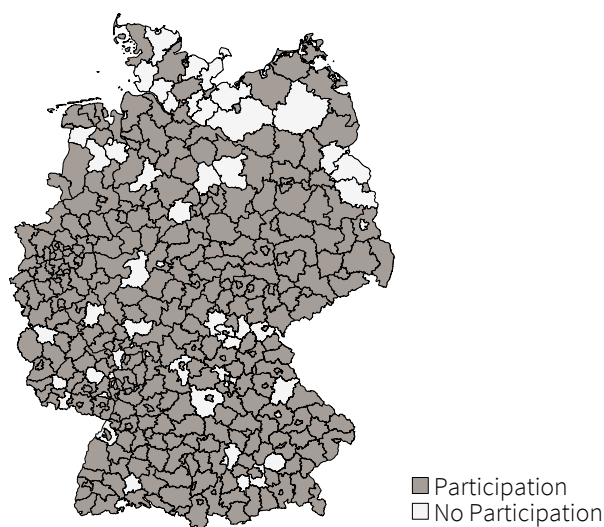
However, the shape and strength of the relationship between incentive size and response is less clear, from the review with some studies demonstrating a positive correlation (Trussell/Lavrakas 2004) and others not finding any significant correlation (Chan et al. 2003).

For postal surveys, a recent experimental design study showed that a small pre-paid incentive is generally most effective for maximizing response rates while minimising costs (Rao 2020). Specifically, the provision of \$2 pre-incentives in postal surveys was more cost-effective than \$10 post-incentives and \$20 post-incentives in the study (ibid.).

#### Pre- and post-incentives offered to directors and pedagogical staff

In line with previous research, we also offered incentives in the ERIK-Surveys 2020. Specifically, we offered pre-incentives for directors and ped-

Figure 3.9-2: Questionnaires of Youth Welfare Offices at District Level



Note: Including partial and complete questionnaires  
Source: DJI, ERIK-Surveys 2020: Survey of Youth Welfare Offices; n=479; unweighted data

agogical staff and additionally post-incentives in case of participation for directors, pedagogical staff and family day-care workers<sup>18</sup> (see Table 3.2-1). The pre-incentives for directors and pedagogical staff were small seed bags (worth about €3).

The post-incentives were a planting box for each childcare facility (worth about €25) in which either the director or at least one member of the pedagogical staff had participated. After the field phase was completed, the post incentives were sent to these institutions with a thank-you letter.

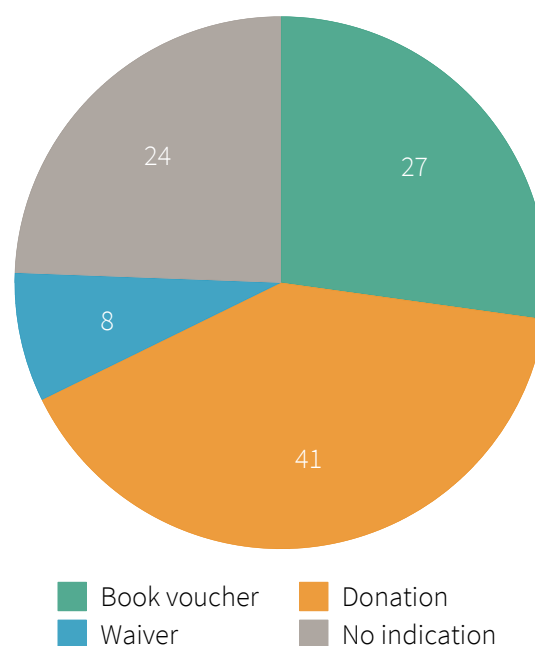
#### Most family day-care workers preferred to donate the post-incentive

Family day-care workers were allowed to choose between different post-incentives (worth about €10). Figure 3.10-1 shows which post-incentives the family day-care workers could choose and how often they did so. 41 % of the family day-care workers surveyed preferred to donate the post-incentive, while only 8 % did without a post-incentive.

No incentives were offered in the surveys of youth welfare offices and childcare providers, as employees in the public service in Germany are generally not allowed to accept rewards, gifts or

<sup>18</sup> Pre-incentives could not be offered to family day-care workers because they were contacted through youth welfare offices.

Figure 3.10-1: Incentive Selection of Family Day-Care Workers (in %)



Source: DJI, ERIK-Surveys 2020: Survey of Family Day-Care Workers, unweighted data

other benefits (§71 German Bundestag 2009; Section I §3 Federal Ministry of the Interior and Community 2005).

### 3.11 Nonresponse Surveys

In the course of two nonresponse surveys (Gedon et al. 2021c), some of the directors and childcare providers who had not participated in the ERIK-Surveys 2020 shortly before the end of the fieldwork were contacted by telephone and asked about the reasons for their non-participation. The ERIK-Nonresponse-Survey of directors took place between 27 June and 7 August 2020, while the ERIK-Nonresponse-Survey of providers was carried out in the period from 1 to 30 September 2020 by the survey institutes.

#### Additional telephone contact with about 8,600 centres

A total of about 8,620 day-care centres from the first tranche were contacted during the telephone reminder for the directors (for more information on the tranches see Section 3.2). In about 1,940 centres (approximately 22 %), no valid telephone



number was available or no director could be reached.

It was found that nearly 290 cases (about 3 %) were not part of the target population. These were after-school centres or day-care centres that have since been closed. In about 250 centres, the questionnaire had already been completed by the director by the time the telephone reminder came (about 3 %). Another 470 centres indicated in the telephone reminder that they had already completed the questionnaire (approx. 5 %). Of these, in about 160 centres no questionnaires were returned at all. A further 3,930 centres (approx. 45 %) indicated that they planned to participate either by post or web option in the near future. In about 3,190 of these cases, an e-mail was sent with the web link to the questionnaire.

In about 1,740 cases (approximately 20 %), participation in the main survey was refused. With 340 of these centres short telephone interviews were conducted. These interviews for the ERiK-Nonresponse-Survey of directors had an average duration of two minutes.

#### **Telephone nonresponse interviews with about 340 directors lasted on average two minutes**

The 8,620 day-care centres were contacted in total about 45,200 times, which implies an average of 5.2 contact attempts per day-care centre. For centres that could not be reached conclusively within the scope of the telephone reminder, an average of 14 contact attempts were made.

#### **Additional telephone contact increased the directors' willingness to participate**

After the telephone reminder, another 860 questionnaires of the directors and 581 questionnaires of the pedagogical staff were completed. For Tranche 1, this means that about 23 % of the directors' questionnaires and about 7 % of the pedagogical staff questionnaires were answered after the telephone reminders.

#### **Additional telephone contact with about 840 childcare providers**

About 840 providers were contacted for the ERiK-Nonresponse-Survey of providers, with an average of just under two contacts (min. one contact

and max. ten contacts). The providers were randomly selected from the sample of providers who had not yet participated or actively refused to participate after the end of the fieldwork.

#### **Telephone nonresponse interviews with about 330 providers lasted on average five minutes**

In an interview lasting approximately five minutes, the providers were asked about structural characteristics (including the type and the legal form of the provider and the number of day-care centres owned by the provider) as well as their reasons for non-participation. The interview was conducted with the person who received the letter of invitation including the questionnaire. Nonresponse interviews with about 330 providers were conducted by telephone in the period from 1 to 30 September 2020.

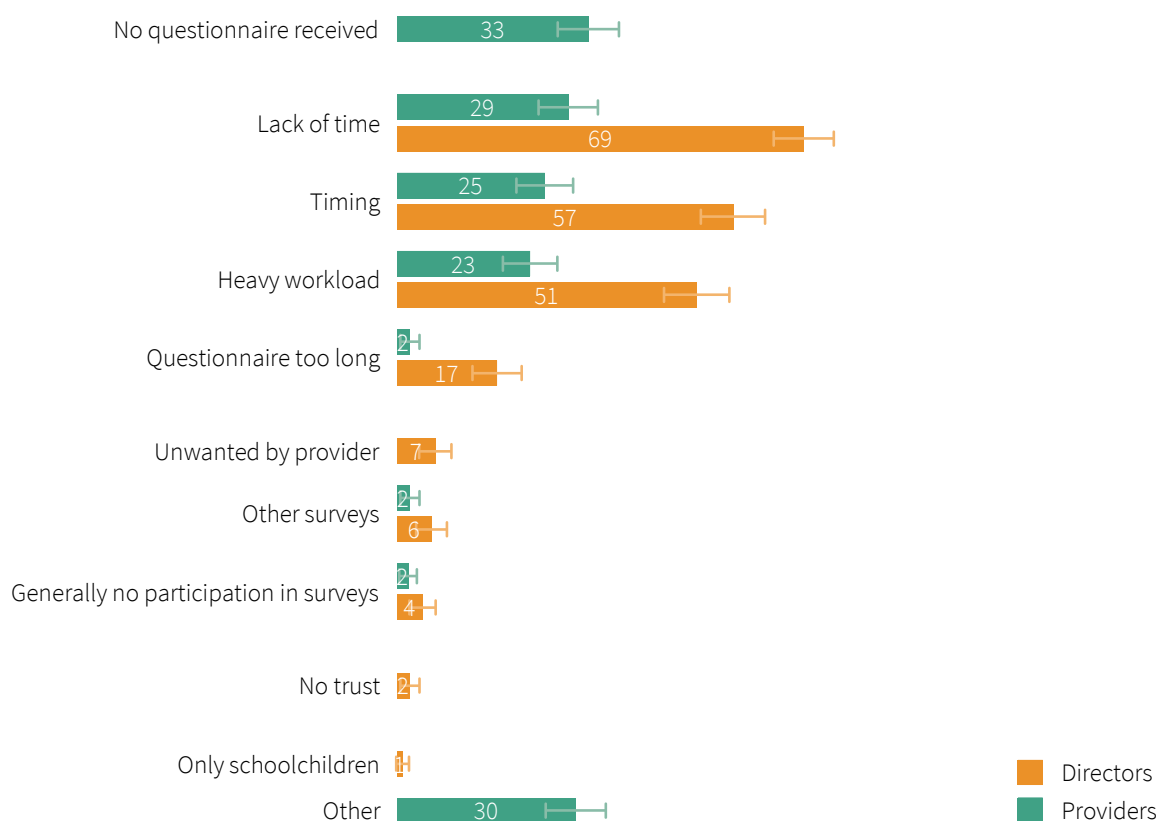
Four providers participated in the ERiK-Surveys 2020 after the telephone reminder as part of the ERiK-Nonresponse-Survey 2020 of providers.

#### **Time constraints and high workload are prominent reasons for non-participation among childcare providers and especially directors**

The reasons for non-participation for both ERiK-Surveys 2020 are shown in Figure 3.11-1. Time constraints were among the most important barriers to participation in the ERiK-Surveys 2020 for both groups. For directors, a lack of time (69 %), timing (57 %) or a heavy workload (51 %) were the main barriers to participation. Also noteworthy is the fact that 17 % of the directors considered the questionnaire too long and therefore did not participate in the ERiK-Surveys 2020.

For childcare providers, a lack of time (29 %), timing (25 %) as well as a heavy workload (23 %) were prominent reasons for non-participation. However, 33 % of the childcare providers said they did not receive a questionnaire and 30 % gave other reasons why they did not participate in the ERiK-Surveys 2020. The nonresponse survey also shows that in both population groups, it was rarely stated that they would not participate in surveys in general or that they would not trust the ERiK project.

Figure 3.11-1: Results of the Two Additional Nonresponse Surveys of Directors and Childcare Providers (in %)



Notes: Up to three multiple answers possible; 16 directors and 54 providers that did not name any reason are not depicted. 'No questionnaire received', 'Other' only asked for providers. 'Unwanted by provider' only asked for centres/directors.

Source: DJI, ERiK-Nonresponse-Surveys 2020: Directors, unweighted data, n=339; DJI, ERiK-Nonresponse-Surveys 2020: Providers, unweighted data, n=329

### Compared to other surveys, 'Generally no participation in surveys' was mentioned less frequently as reason for nonresponse

Other studies that survey individuals like the German General Social Survey (in German: Allgemeine Bevölkerungsumfrage der Sozialwissenschaften (ALLBUS) (Erbslöh/Koch 1988) or the European Social Survey (ESS) (Kreuter/Kohler 2009) show somewhat different reasons for non-response. A lack of time is also frequently mentioned as an obstacle in these surveys (19 % ALLBUS, 13 % ESS). However, the proportion of respondents who generally do not participate in surveys (33 % ALLBUS, 25 % ESS) (Menold/Züll 2011) is comparatively low in the ERiK-Surveys 2020.

### Sampling frame for providers needs improvement and the ERiK-Surveys 2020 questionnaires were too long

The fact that more than one third of the providers in the ERiK-Nonresponse-Survey 2020 had not

received a questionnaire for the ERiK-Surveys 2020 shows that the sampling frame (in this case, the commercial list; for more information, see the 'ERiK Methodological Report I' Schacht et al. 2021b) needs to be improved for the ERiK-Surveys 2022.<sup>19</sup>

Partly due to the feedback of time constraints and the questionnaire being too long, the length of the instruments should be reduced for the ERiK-Surveys 2022. This should mitigate one barrier to participation – not just for directors and childcare providers, but for all target populations since shorter questionnaires usually lead to higher response rates (Deutskens et al. 2004; P. Edwards et al. 2002; Sahlqvist et al. 2011).

<sup>19</sup> We plan to no longer use commercially acquired address lists as a basis for contacting child day-care centres and providers in the ERiK-Surveys 2022, but rather to ask the federal states to supply address lists and to use these and only to supplement them with commercially acquired address lists as necessary.



## 4. Data Quality of the ERiK-Surveys 2020

One objective of the ERiK study is to reliably estimate distribution and correlation measures for the ERiK target populations and thereby assess the framework conditions affecting the quality of ECEC in Germany. To this end, possible sources of error at different stages of the survey process (summarised in the concept of *Total Survey Error*, Groves 2004) must be taken into account. Some of these stages were already evaluated in the ERiK Methodological Report I (Schacht et al. 2021b).

### Data quality of the ERiK-Surveys 2020 evaluated according to strict criteria

In this chapter we

1. examine selectivity: the extent to which the distribution of the characteristics of interest in the aggregate is skewed and the number of outliers (see Section 4.1);
2. evaluate nonresponse and address it by weighting (see Section 4.2);
3. analyse whether the sample size is large enough to make reliable statements about subgroups and to be able to calculate asymptotic confidence intervals (Gabler/S. Häder 2019, p. 41, see Section 4.3).<sup>20</sup>

### 4.1 Selectivity

To identify potential selectivity, e.g. due to different sampling and participation probabilities, some summary statistics were compared between the ERiK-Surveys 2020 and other distributions. The ERiK samples of day-care centres, directors, pedagogical staff and family day-care workers were compared to official register data (KJH statistics 2020, Federal Statistical Office 2020). In the case of the complete surveys of youth welfare offices and providers, their samples were collated

with the respective sampling frame (for more information on the sampling frames for the ERiK-Surveys 2020, see the ERiK Methodological Report I, Schacht et al. 2021b).

### Overrepresentation of directors and pedagogical staff with higher employment volumes

In the ERiK-Surveys 2020, several groups of respondents are overrepresented<sup>21</sup> compared to their population size in the official KJH statistics 2020 or the sampling frame (see also Table 4.1-1):

- › day-care centres with a relatively high number of approved places and day-care centres funded by public providers (compared to the KJH statistics);
- › directors with higher volumes of employment or with a university degree relevant to their work (compared to the KJH statistics);
- › pedagogical staff with higher volumes of employment or with higher educational degrees (compared to the KJH statistics);
- › family day-care workers working in larger family day-care facilities, who have attended a qualification course with fewer hours, working in larger family day-care facilities with a very small or large number of children or working outside of large family day-care facilities with five or more children in their care (compared to the KJH statistics);
- › public childcare providers participated more often than private childcare providers (compared to the sampling frame).

Youth welfare offices participated with a similar frequency as in the sampling frame regarding the variables examined (number of family day-care workers in the youth office district and the number of inhabitants in the district).

<sup>20</sup> This list shows that a large sample size does not necessarily lead to a high data quality of a survey if other aspects of the selection are not taken into account (for a note on *representativeness*, see Infobox 2.1). However, sufficiently large sample sizes are necessary for the accuracy of estimators.

<sup>21</sup> In this section, overrepresentation refers to the results of a Chi<sup>2</sup> test being statistically significant at  $\alpha = 0.05$ .



Table 4.1-1: Deviations in some Summary Statistics between the ERiK-Surveys 2020 and the KJH Statistics or Sampling Frame (in Percentage Points)

	CEN	DIR	PST	FDW	YWO	PRO
Federal state	2.5	2.5	2.5	1.2	0.5	0.9
Type of provider (public vs private)	3.0	–	–	–	–	–
Number of children per centre	3.4	–	–	–	–	–
Highest educational degree	–	2.8	8.0	–	–	–
Volume of employment	–	4.0	3.6	–	–	–
Share of FDW in larger child day-care facilities	–	–	–	9.2	–	–
No. of children in FDW care	–	–	–	6.0	–	–
No. of children in FDW in larger facilities care	–	–	–	3.7	–	–
Level of qualification of FDW	–	–	–	10.0	–	–
Number of family day-care workers	–	–	–	–	0.4	–
Population	–	–	–	–	0.6	–
Type of provider (four categories)	–	–	–	–	–	4.1

Note: Abbreviations: CEN = Centres, DIR = Directors, PST = Pedagogical Staff, FDW = Family Day-Care Workers, YWO = Youth Welfare Offices, PRO = Providers.

Source: DJI, ERiK-Surveys 2020, unweighted data; Research Data Centre of the Statistical Offices of the Federal States, Statistik der Kinder- und Jugendhilfe, Kinder und tätige Personen in Tageseinrichtungen und in öffentlich geförderter Kindertagespflege, 2020

### Mean deviation of the ERiK-Surveys 2020 from the KJH statistics or sampling frames is only minor

Table 4.1-1 lists the criteria tested. It shows the respective mean absolute deviation by variable if the sample distribution is compared with the respective population distribution from the KJH statistics 2020 or the sampling frame. The individual deviations range from 0.0 (youth welfare offices in Saarland) to 15.3 percentage points (family day-care workers with 160 to 299 hours of training and without (specialised) pedagogical training). On average, the deviation between the ERiK-Surveys 2020 and the target populations for the variables examined is 3.6 percentage points.<sup>22</sup>

The largest proportional deviation compared to the KJH statistics 2020 is for the director survey in Bremen. These make up only 0.8 % of the total population of directors in day-care centres (registered in KJH statistics 2020), while in the ERiK-Surveys 2020 they represent 2.3 % of the sample. The proportion in the ERiK-Surveys 2020 is thus almost three times as high.

There are also statistically significant deviations from the KJH statistics 2020 or the sampling frames in the distribution of the target populations among the federal states in the

ERiK-Surveys 2020.<sup>23</sup> Specifically, we found the following discrepancies in the ERiK-Surveys 2020:

- › Across federal states (with the exception of Hesse), directors and pedagogical staff participated significantly more (directors: eight states; pedagogical staff: nine states) or less (directors: seven states; pedagogical staff: six states) frequently in the ERiK-Surveys 2020 compared to their distribution across the federal states in the KJH statistics.
- › The proportions of surveyed family day-care workers deviate significantly from the respective proportions in the KJH statistics for the following federal states: Baden-Württemberg, Berlin, Brandenburg, Hamburg, Mecklenburg-Western Pomerania, Saarland and Schleswig-Holstein (fewer than in the KJH), North Rhine-Westphalia and Saxony (more than in the KJH statistics).
- › Regarding youth welfare offices, statistically significant deviations from the population shares were limited to Mecklenburg-Western Pomerania and Schleswig-Holstein where fewer youth offices participated.
- › The providers in Bavaria, Berlin, Hesse, Mecklenburg-Western Pomerania, North Rhine-Westphalia, Rhineland-Palatinate and Saxony deviate from the distribution across the federal states according to the sampling frame

<sup>22</sup> This average deviation was calculated as the mean of the absolute individual deviations of all tested variables.

<sup>23</sup> Statistically significant differences from the population are tested with t-tests at the 5 % significance level ( $\alpha = 0.05$ ) and for the youth welfare offices at the 10 % significance level ( $\alpha = 0.10$ ) due to the small sample size.

(for more information on the sampling frames of the ERIK-Surveys 2020, see the ‘ERiK Methodological Report I’ Schacht et al. 2021b).

In conclusion, there are some minor deviations from the populations in our samples, however, these are addressed in the weighting process as outlined in the next Section (4.2).

## 4.2 Weighting

**The final weights for the ERIK-Surveys 2020 data are calibrated and trimmed (combinations of) design and/or nonresponse weights**

In order to be able to make generalised statements about the target populations on the basis of the data from the ERIK-Surveys 2020, we correct for the different sampling and participation probabilities using a weighting procedure (see e.g. Valliant/Dever/Kreuter 2013, chapter 13; Lavallée/Beaumont 2015). This is generally done by combining up to three types of weights, which are elaborated on in their respective subsections:

1. The design weights compensate for the different sampling probabilities resulting from the complex sample designs in some of the surveys for further information on the sample design of the ERIK-Surveys 2020, see the ERIK Methodological Report I (Schacht et al. 2021b); for general information on design weights, see (Gabler et al. 2015).<sup>24</sup>
2. The nonresponse weights compensate for the different survey-specific participation probabilities of the target populations in the ERIK-Surveys 2020.<sup>25</sup>
3. The combination of these two weighting factors was calibrated using selected distributions in the population (from the KJH statistics 2020 Federal Statistical Office 2020). The resulting calibrated weights were then trimmed (Sand/Kunz 2020) resulting in our final weights.<sup>26</sup>

<sup>24</sup> Since the ERIK-Surveys 2020 of youth welfare offices and child day-care centres were complete population surveys, it was not necessary to generate design weights for these surveys.

<sup>25</sup> Since a nonresponse weighting requires that information on the non-participants is available, a nonresponse weighting could not be carried out for all ERIK-Surveys 2020. Specifically, there is no information on family day-care workers at the level of youth welfare office district that could have been used for this purpose, so no nonresponse weight was created for this ERIK-Survey 2020.

<sup>26</sup> Since no nonresponse weight was created for family day-care workers, only the design weight was used for this ERIK-Survey 2020.

**For the ERIK-Surveys 2020, there are three final weights at individual level and three at institution level**

At the individual level, weights are available for directors, pedagogical staff and family day-care workers, and at the institutional level for day-care centres, youth welfare offices and childcare providers.<sup>27</sup>

The weighting factors compensate for the (marginal) selectivity of the ERIK-Surveys 2020 previously mentioned in Section 4.1.<sup>28</sup> The following sections present the weighting process of the ERIK-Surveys 2020, with an overview depicted in Table 4.2-1.

### Design Weights

The design weights (also called base weights) compensate for the varying sampling probabilities resulting from the disproportionate sampling designs for directors, pedagogical staff and family day-care workers (for more information, see the ERIK Methodological Report I, Schacht et al. 2021b).

**In the ERIK-Surveys 2020, the design weights for day-care centres and directors are identical**

The design weight for day-care centres is the same as the design weight for directors because, according to our target population definition, there is only one director per centre who is authorised to answer the questions at the individual and institutional level for the respective day-care centre (for more information, see the ERIK Methodological Report I, *ibid.*).

The design weight for day-care centres and directors was calculated by dividing the total number of day-care centres in a federal state by the number of day-care centres contacted per federal state (the inverse of the selection probability, see Kroh et al. 2017, p. 17 as cited in; Horvitz/Thompson 1952).

<sup>27</sup> Furthermore, it is possible to generate weights for the survey of the providers at the level of the child day-care centres via transformation weights (for more information, see L. Ulrich/Schacht 2021).

<sup>28</sup> It should be noted, however, that this does not always sufficiently ensure that the results of the sample can be transferred to the population with regard to the variables under investigation (see also Kauermann/Küchenhoff 2011).

Table 4.2-1: **Overview of the Weighting Process of the ERIK-Surveys 2020**

	Centres / Directors	Pedagogical Staff	Family Day-Care Workers	Youth Welfare Offices	Providers
Design weight (DW)	total number of centres in a federal state divided by the number of contacted centres in the federal state	multiplication of 1. the design weight of centres by 2. the inverse proportion of contacted pedagogical staff of the number of existing pedagogical staff in the centre	1. logistic regression for the likelihood that the YWO distributed questionnaires to FDW inverted and multiplied by 2. the inverse proportion of contacted FDW of the total number of registered FDW per YWO-district	none (complete survey)	none (complete survey)
Nonresponse weight (NW)	logistic regression with: 1. type of provider, 2. number of places for children (log), 3. interaction of 1. and 2., 4. first digit of postal code	logistic regression with: 1. type of provider, 2. number of places for children (log), 3. interaction of 1. and 2., 4. first digit of postal code	none (missing frame) sampling	logistic regression with: 1. federal state, 2. number of inhabitants per youth office district (5 cat.), 3. FDW per YWO-district (5 cat.), 4. day-care centres per YWO-district (5 cat.), 5. tranche	logistic regression with: 1. federal state (grouped to 12 cat.), 2. type of provider (7 cat.), 3. tranche
Calibrated weight (CW)	for centres: 1. number of centres per type of provider (3 cat.), per federal state, 2. number of places for children (8 cat.). For directors: 1. number of directors per federal state, 2. scope of employment (3 cat.)	1. number of ped. staff per federal state, 2. highest degree (4 cat.), 3. scope of employment (3 cat.)	for FDW: 1. number of FDW per federal state, 2. number of children in family day-care (6 cat.), 3. highest degree and hours of qualification course of FDW (3 cat.). For GTP: 1. number of GTP per federal state, 2. number of children in GTP care, 3. highest degree and hours of qualification course of FDW	1. number of YWO per federal state, 2. number of inhabitants per YWO-district (5 cat.), 3. FDW per YWO-district (5 cat.), 4. day-care centres per YWO-district (5 cat.)	for centres: 1. number of centres per federal state, 2. type of provider (7 cat.)
Trimming of final weights	centres: < 1 and > 99 percent directors: > 99 percent	> 99 percent	> 99 percent at DW and final weights	> 99 percent	> 99 percent
Names of final weighting variables	centres: nwe   directors: nww	nww	nww	nww	centres: nwe   providers: nww (only nonresponse weight)

Notes: Calibration method: iterative proportional fitting (raking). If not specified otherwise, the distributions are always the total distributions for Germany. Abbreviations: FDW = Family Day-Care Workers, GTP: larger family day-care facilities (from German: Großtagespflege), YWO = Youth Welfare Offices, cat. = categories.

**The design weights for pedagogical staff and family day-care workers reflect their distribution through day-care centres/directors and youth welfare offices, respectively**

Since pedagogical staff were selected by contacting directors of ECEC centres, the design weights for pedagogical staff were generated by multiplying the design weights of day-care centres/directors (see the previous step) by the inverse proportion of contacted pedagogical staff of the number of existing pedagogical staff in the centre. Staff sizes were determined based on information given by the directors in the ERiK-Survey 2020. Missing data points were imputed with mean values.<sup>29</sup> If the number of returned questionnaires from pedagogical staff exceeded the staff size given by a director or the imputed value, the staff size was corrected based on the returned questionnaires.

The design weights of the family day-care workers also reflect that they were included in the sample indirectly, in this case via the youth welfare offices. A logistic regression model was used to estimate how likely youth welfare offices were to distribute questionnaires among the family day-care persons in their districts.<sup>30</sup> We then took the inverse of this probability and multiplied it by the inverse of the proportion of family day-care workers contacted per youth welfare office district as included in our sampling design (see ERiK Methodological Report I Schacht et al. 2021b).

**The complete surveys of youth welfare offices and childcare providers do not require design weights**

No design weights were calculated for youth welfare offices and childcare providers, as in both

cases all units in the sampling frame were contacted and the sampling frames correspond to the complete target population.<sup>31</sup>

## Nonresponse Weights

**Nonresponse is modelled by logistic regression for all ERiK-Surveys 2020 except for family day-care workers**

If respondents and nonrespondents differ systematically, nonresponse in a survey leads to bias. Nonresponse weights aim to compensate for the different participation probabilities of potential respondents and to mitigate potential nonresponse bias (Kroh et al. 2017, p. 21). In line with other studies such as the Socio-Economic Panel (SOEP) study, the ERiK project uses logistic regressions to estimate the response likelihood for cases in the ERiK-Surveys 2020 (see e.g. J. K. Kim/J. Kim 2007; Kroh et al. 2017).

The nonresponse models for the day-care centres/directors and pedagogical staff were estimated with the same variables via logistic regressions: the type of provider that manages the centre, the number of places for children in the centre (log-transformed<sup>32</sup>), the interaction term of provider type and number of places, and the first digit of the postal code to control for possible region-specific effects.<sup>33</sup>

**Directors and pedagogical staff in larger centres were more likely to respond to the ERiK-Surveys 2020**

The nonresponse models for directors and pedagogical staff are depicted in Table 4.2-2. The pseudo  $R^2$  of 0.015 (for directors) and 0.017 (for pedagogical staff) indicates a low model fit in both models. This suggests the absence of large selection bias: A large number of variables were tested for their influence on response probabilities and only a few actually explain variance in (non-)response. Nevertheless, it is informative to take a closer look at factors influencing the chance

29 The values that were imputed were the mean for the respective youth office district or, if this information was also missing, the mean of the federal state.

30 The dependent variable in the logistic regression was the statement of the youth office whether they forwarded questionnaires to their family day-care workers. This information was not part of the questionnaire but was instead gained by the survey institute in their telephone calls with the youth offices. The analysis was executed on the youth office level and the model included controls for the federal states, the number of inhabitants of the youth office districts, the number of centres in the districts and the number of family day-care workers in the districts. Missing information on the last two variables (in Berlin and Hamburg) were imputed with the respective mean. According to pseudo- $R^2$  (see e.g. Veall/Zimmermann 1996) the explained variance was 4.3 %, indicating that the included characteristics of the youth office have only a limited influence on the decision to distribute questionnaires.

31 While there might be significant coverage error in the sampling frame of childcare providers, there is no better record of the population, making it impossible to test for or quantify this error. For more information on the sampling frames, see the ERiK Methodology Report I (Schacht et al. 2021b).

32 The variable was log-transformed so its values resemble a normal distribution. The variable was additionally log-transformed for the following interaction terms for the same reason.

33 In cases where information on the number of places for children in the centre was missing, it was imputed with the respective mean in the youth office district or the federal state (if the former was also missing).

Table 4.2-2: **Nonresponse Models for Directors and Pedagogical Staff**

	Directors		Pedagogical Staff	
	Coefficient	Standard Error	Coefficient	Standard Error
Workers' Welfare Association	Reference category		Reference category	
Parent Initiative	3.804*	1.88	2.017	1.24
Protestant Church	1.033	0.90	0.837	0.56
Catholic Church	1.877*	0.95	0.725	0.58
Communal Provider	0.677	0.83	0.117	0.52
Private For-Profit Provider	-0.001	1.52	-0.328	1.15
Other Private Provider	0.774	0.88	0.212	0.56
Registered Association	1.121	0.84	-0.049	0.53
Type of Provider Unknown	0.586	0.82	-0.568	0.52
No. Centre Places (log)	0.380*	0.17	0.409***	0.11
Workers' Welfare Association # No. of Centre Places (log)	Reference category		Reference category	
Parent Initiative # No. Centre Places (log)	-0.976+	0.51	-0.593+	0.34
Protestant Church # No. Centre Places (log)	-0.226	0.21	-0.210	0.13
Catholic Church # No. Centre Places (log)	-0.424+	0.22	-0.165	0.14
Communal Provider # No. Centre Places (log)	-0.204	0.19	-0.080	0.12
Private For-Profit Provider # No. Centre Places (log)	-0.025	0.36	-0.112	0.28
Other Private Provider # No. Centre Places (log)	-0.230	0.20	-0.105	0.13
Registered Association # No. Centre Places (log)	-0.282	0.20	-0.027	0.12
Type of Provider Unknown # No. Centre Places (log)	-0.244	0.19	0.025	0.12
Postcode Area 0	Reference category		Reference category	
Postcode Area 1	-0.301***	0.08	-0.252***	0.05
Postcode Area 2	-0.185*	0.08	-0.008	0.05
Postcode Area 3	-0.049	0.08	0.118*	0.05
Postcode Area 4	0.250*	0.10	0.309***	0.06
Postcode Area 5	0.234**	0.09	0.318***	0.05
Postcode Area 6	-0.006	0.08	0.328***	0.05
Postcode Area 7	0.147+	0.09	0.282***	0.06
Postcode Area 8	0.224*	0.09	0.532***	0.06
Postcode Area 9	0.173*	0.09	0.330***	0.05
Constant	-2.301**	0.76	-3.115***	0.47
Observations	13200	–	47202	–
Pseudo R-squared	0.015	–	0.017	–

Note: Standard errors in parentheses, + p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Source: DJI, ERIK-Surveys 2020, unweighted data

of answering the questionnaires: Centres that are managed by parent initiatives or the catholic church seem to have a higher chance of participating in the survey compared to centres managed by the workers' welfare association (AWO) (reference category). The nonresponse model also indicates that directors and pedagogical staff in larger centres have higher response probabilities than those in smaller centres. Furthermore, the geographic location (postcode area) of the centre seems to influence the directors' and staff members' likelihood of response.

**Of the tested variables, only the federal state influenced the response behaviour of youth offices in a statistically significant way**

For youth offices, the nonresponse model (see Table 4.2-3) contained the following variables: the youth office's federal state, the number of inhabitants per youth office district, the number of family day-care workers per youth office district, the number of day-care centres per youth office district<sup>34</sup> and lastly the

<sup>34</sup> The number of inhabitants, the number of FDW and the number of centres were all split into quintiles.

Table 4.2-3: **Nonresponse Model for Youth Welfare Offices**

	Coefficient	Standard Error
Baden-Wuerttemberg	Reference category	–
Bavaria	0.216	0.47
Berlin	0.105	0.77
Brandenburg	-0.110	0.63
Bremen	-0.579	Jan 50
Hamburg	-0.859	0.86
Hesse	-0.529	0.50
Mecklenburg-Western Pomerania	-1.838*	0.90
Lower Saxony	0.026	0.48
North Rhine-Westphalia	0.281	0.44
Rhineland-Palatinate	0.040	0.53
Saarland	0.169	1.00
Saxony	-0.129	0.72
Saxony-Anhalt	1.126	0.82
Schleswig-Holstein	-1.359*	0.62
Thuringia	2.160*	0.88
Population (1st quintile)	Reference category	–
Population (2nd quintile)	-0.716	0.47
Population (3rd quintile)	-0.689	0.63
Population (4th quintile)	-0.939	0.75
Population (5th quintile)	-1.433+	0.87
No. of FDW (1st quintile)	Reference category	–
No. of FDW (2nd quintile)	0.473	0.31
No. of FDW (3rd quintile)	0.461	0.35
No. of FDW (4th quintile)	0.661	0.40
No. of FDW (5th quintile)	0.943+	0.53
No. of Day-Care Centres (1st quintile)	Reference category	–
No. of Day-Care Centres (2nd quintile)	0.586	0.47
No. of Day-Care Centres (3rd quintile)	1.188+	0.63
No. of Day-Care Centres (4th quintile)	1.039	0.75
No. of Day-Care Centres (5th quintile)	1.514+	0.86
First/Only Tranche	Reference category	–
Second Tranche	0.177	0.19
Constant	-0.118	0.51
Observations	575	–
Pseudo R-squared	0.055	–

Note: Standard errors in parentheses; + p<0.10; \* p<0.05; \*\* p<0.01; \*\*\* p<0.001  
Source: DJI, ERIK-Surveys 2020, unweighted data

tranche.<sup>35</sup> Similar to the nonresponse models of directors and pedagogical staff, the model fit for youth offices is low (0.055). The only factor impacting the response probability at conventional levels of statistical significance ( $\alpha = 0.05$ ) is the indicator for the federal state. Compared to youth offices in Baden-Württemberg (reference category), offices located in Mecklenburg-Western

Pommerania or Schleswig-Holstein are less likely to respond, while youth offices in Thuringia are more likely to respond.

In the nonresponse model for childcare providers of day-care centres (see Table 4.2-4) the federal state in which the provider is located, the type of provider and the tranche were controlled for.

<sup>35</sup> In Berlin and Hamburg, the mean was imputed for the number of FDW per YWO district and for the number of day-care centres per YWO district.



Table 4.2-4: **Nonresponse Model for Providers of Day-Care Centres**

	Coefficient	Standard Error
Baden-Wuerttemberg	Reference category	–
Bavaria	0.239**	0.09
Berlin	0.386*	0.17
Brandenburg + Mecklenburg-Western Pomerania	-0.326**	0.12
Lower Saxony + Bremen	0.016	0.10
Schleswig-Holstein + Hamburg	-0.162	0.15
Hesse	0.083	0.11
North Rhine-Westphalia	0.000	0.08
Rhineland-Palatinate + Saarland	-0.118	0.11
Saxony	0.169	0.12
Saxony-Anhalt	-0.238	0.17
Thuringia	-0.414**	0.15
Workers' Welfare Association	Reference category	–
Private For-Profit Provider	-0.483+	0.26
Other Private Provider	-0.323+	0.18
Protestant Church	-0.537**	0.19
Catholic Church	-0.680***	0.19
Communal Provider	-0.152	0.18
Missing/Type Unknown	-0.770***	0.20
Tranche 1a	Reference category	–
Tranche 1b	-0.396**	0.13
Tranche 2a	-1.021**	0.31
Tranche 2b	-0.712***	0.05
Constant	-1.210***	0.19
Observations	14942	–
Pseudo R-squared	0.029	–

Note: Standard errors in parentheses; + p<0.10; \* p<0.05; \*\* p<0.01; \*\*\* p<0.001

Source: DJI, ERiK-Surveys 2020, unweighted data

As with the previous target populations, the model fit of the nonresponse model for child-care providers of day-care centres is low (0.029). Again, the federal state seems to influence the likelihood of responding to this ERiK-Survey 2020: the likelihood is higher for childcare providers located in Bavaria and Berlin, but lower for those in Brandenburg, Mecklenburg-Western Pomerania and Thuringia. Compared to all other types of childcare providers, the workers' welfare association (AWO) has the highest response probability. The childcare providers that were sampled in Tranche 1a (online and paper questionnaire) are also more likely to respond than those of the other tranches.

No nonresponse weight exists for family day-care workers. Due to the indirect sampling process through youth offices, the information on the (nonresponding) gross cases is not available

and the calculation of a nonresponse weight is thus impossible.

## Calibrated Weights

**The ERiK-Surveys 2020 are calibrated to the population characteristics, taken mostly from the KJH statistics, using the method of raking**

In a last step, the combined design and nonresponse weights were calibrated using known population distributions to reduce variance and alleviate the remaining nonresponse or coverage error that has not been corrected for in the previous steps (Sand/Kunz 2020). The ERiK project used data from the official KJH statistics 2020 (Federal Statistical Office 2020) as the population distributions and employed iterative proportional

fitting (raking) as a calibrating method (Deming/Stephan 1940; Deville/Särndal/Sautory 1993; Kolenikov 2014). This method is mostly used if only the marginal distributions of the population are known or available for the calibration variables, which makes poststratification impossible (Sand/Kunz 2020).

Directors of day-care centres answered questions on the institutional level in their role as representative of the centre as well as on the individual level. Thus, we create two different calibration weights which we apply for analyses on the institutional level on the one hand and analyses on the individual level of directors on the other hand. The distributions used for the calibration of day-care centres were the number of centres per type of provider<sup>36</sup> per federal state and the number of places for children in the centre.<sup>37</sup> For the level of directors as individuals, the number of directors per federal state and the scope of employment<sup>38</sup> were used to calibrate the data of the ERiK-Surveys 2020 to the KJH statistics.

The pedagogical staff distributions were calibrated to the distributions of the number of pedagogical staff per federal state, the highest educational degree achieved by the pedagogical staff<sup>39</sup> and the scope of employment.<sup>40</sup>

A different calibration approach was used for normal family day-care workers and those who work in larger family day-care facilities.<sup>41</sup> First, for normal family day-care workers, we used the number of family day-care workers per federal state, the number of children in family day-care<sup>42</sup> and the qualifications of family day-care work-

ers.<sup>43</sup> Second, for family day-care workers in larger family day-care facilities, we used their number per federal state, the number of children in larger family day-care facilities<sup>44</sup> and the qualifications of family day-care workers<sup>45</sup>.

The youth office data was calibrated to the data of the KJH statistics using the distributions of the number of youth offices per federal state, the number of inhabitants per youth office district, the number of family day-care workers per youth office district and the number of day-care centres per youth office district.<sup>46</sup>

For childcare providers, there is no reliable population data, hence it was not possible to calibrate the childcare provider survey. Thus, for analyses on the provider level only the nonresponse weight can be used. It is possible to make statements on the day-care centre level by calibrating the childcare provider data to this level, however, using the number of centres per federal state and the type of provider.<sup>47</sup>

To reduce the impact of extreme cases and thus the variance, we trimmed the calibrated final weights for all surveys at the 99th percentile (*ibid.*; Yu 1994). In the case of day-care centres, the final weights were additionally trimmed at the first percentile, as their distribution is not only skewed to the right but also has a long left tail. After trimming, the weights were standardised for the respective total N in the populations. This means the sum of weights equals the number of units in the respective populations, which makes it easier to interpret the estimates with respect to the populations. Table 4.2-5 gives summary statistics for the weights of the ERiK-Surveys 2020.

36 The variable was categorised into three categories (public, private and not assigned). This reduces the number of potential combinations and makes the calibration more stable. This was also done for variables in the calibration of other surveys for this reason. In the following footnotes, the categories per variable are given.

37 Here, missing data was imputed by using information from a valid proxy variable in the sample that provides the necessary data. The variable was then split into eight categories (1-10, 11-20, 21-25, 26-50, 51-75, 76-100, 101-125, 126 and more places in the centre).

38 It was split into three categories (fewer than 32 hours, 32 to 38.5 hours, more than 38.5 hours weekly).

39 The variable was split into the following four categories: (relevant) university degree, (relevant) professional school degree (in German: Fachschulabschluss), (relevant) vocational school qualification (in German: Berufsfachschulausbildung), other/(as yet) no qualification

40 It was categorised into the same three categories as for the directors.

41 For more information on larger family day-care facilities, see the ERiK Methodology Report I (Schacht et al. 2021b).

42 In six categories (1, 2, 3, 4, 5, 6 or more children).

43 This variable was constructed by combining the highest educational degree with the extent of their qualification course. For the calibration, the following three categories were used: fewer than 160 hours of qualification course and no specialised pedagogical qualification, 160 to 299 hours of qualification course and no specialised pedagogical qualification, and lastly, one category containing all other possible combinations of qualification course and specialised pedagogical qualification.

44 Here, missing values in the ERiK data were imputed from a valid proxy variable. Subsequently, the variable was cut into the following six categories: up to 5, 6-8, 9-11, 12-15, 16-19, 20 or more children.

45 With the same three categories as for normal family day-care workers.

46 As in the calculation of the nonresponse weight, the number of inhabitants, the number of FDW and the number of centres were all split into quintiles and the missing data on the last two variables was imputed for Berlin and Hamburg.

47 The types of providers were grouped into five categories (public providers, protestant church, catholic church, parity welfare association, other private providers).



Table 4.2-5: Summary Statistics of the Weights of the ERiK-Surveys 2020

Weight	Min.	10 %	25 %	Quantiles			Max.	Mean	S.D.
				50 %	75 %	90 %			
Centre/Director: DW	0.3	0.5	0.5	1.0	1.4	1.8	1.8	1.0	0.5
Centre/Director: NRW	0.6	0.7	0.8	1.0	1.1	1.3	2.1	1.0	0.2
Centre: FW	0.9	5.9	7.4	13.0	18.3	23.4	44.2	13.9	7.7
Director: FW	3.0	5.9	7.5	13.4	19.3	23.1	34.6	13.9	7.1
Pedagogical Staff: DW	0.1	0.3	0.5	0.8	1.4	1.9	5.7	1.0	0.7
Pedagogical Staff: NRW	0.1	0.4	0.5	0.9	1.3	1.8	5.0	1.0	0.6
Pedagogical Staff: FW	4.0	19.3	29.8	49.4	83.2	137.6	318.3	67.0	56.3
Family Day-Care Workers: DW	1.1	1.3	2.3	2.6	2.9	3.3	5.6	2.5	0.7
Family Day-Care Workers: FW	0.6	3.5	5.7	9.1	14.2	24.1	67.1	12.1	10.6
Youth Offices: NRW	1.0	1.3	1.3	1.4	1.6	1.8	5.2	1.5	0.4
Youth Offices: FW	1.0	1.2	1.4	1.5	1.6	1.8	2.9	1.5	0.3
Providers: NRW	3.3	4.6	5.4	7.1	9.1	12.7	23.6	7.9	3.3
Providers/Centres: FW	5.7	13.3	17.7	24.2	35.0	47.4	86.1	28.4	15.0

Note: Abbreviations: DW: Design Weight; NRW: Nonresponse Weight; FW: Final Calibrated + Trimmed Weight  
Source: DJI, ERiK-Surveys 2020, unweighted data

### 4.3 Informative Value at the Federal and State Levels

The weighting of the ERiK-Surveys 2020 is important to correct for potential bias due to different sampling and participation probabilities. However, if the number of observations of a survey is too small, even a well-conducted survey has little chance of detecting hypothesised effects because of the lack of statistical power. In other words, the question arises how precise or how accurate the data should be in the first place to effectively draw valid inferences for the surveyed populations on the federal and state levels.

**Necessary sample sizes are hard to achieve for small target populations and in regionalised analyses**

The calculation of the necessary sample size requires specific information about the research questions investigated in the population under study (Singh/Masuku 2014). One rule of thumb in this context is that larger sample sizes generally lead to increased precision when estimating unknown parameters (ibid.). The smaller the sample, the greater the average sampling error (Christians/Wirth 2009). This is particularly problematic for small target populations such as youth welfare offices and in

regionally disaggregated analyses, which entail fewer cases (A. Müller 1992; cited in Christians/Wirth 2009). Based on some frequently used guidelines and discussions in the literature (e.g. Cohen 1988; Lenth 2001; van Wilson Voorhis/Morgan 2007; Lance/Vandenberg 2009), sample sizes for proportions can be calculated with the following formula (M. Häder/S. Häder 2014):

$$n \geq \frac{N \cdot z^2 \cdot p(1-p)}{z^2 \cdot p(1-p) + N \cdot e^2} \quad (4.1)$$

Accordingly, four different values are necessary for the calculation of the necessary sample size (n):

1. Population size (N)
  2. Permissible error probability (z)<sup>48</sup>, tabulated from the standard normal distribution for  $\alpha$ , e.g.  $\alpha = 0.05$  is  $z = 1.96$
  3. Expected proportion value of a parameter. A conservative approach is to use  $p = 0.5$  (p) that yields the highest possible error
  4. Permissible absolute sampling error (e)<sup>49</sup>
- If, for example, one assumes a size of the population of between  $N = 10,000$  and  $50,000$  elements

<sup>48</sup> The absolute sampling error refers to the deviation of the estimate from the true value.

<sup>49</sup> The error probability (also Type I error) denotes the probability that the null hypothesis is rejected although it is correct.

and if we require that the estimate is accurate to  $\pm$  five percentage points ( $e = 0.05$ ), then the sample should include at least 370-383 randomly selected participants. Moreover, this calculation is considered a conservative estimate, i.e., a particularly safe variant of an estimate, since it is assumed that the proportions ( $p$ ) to be estimated are 50 % and with a permissible error probability of  $z = 1.96$  (ibid.).

**Valid and generalisable conclusions for the target populations can be drawn from the ERIK-Surveys 2020 at federal level**

All five ERIK-Surveys 2020 provide the necessary sample sizes calculated with such conservative assumptions<sup>50</sup> to infer upon populations in Germany as a whole. Therefore, no limitations are expected at this level, so that valid and generalisable conclusions for the target populations can be drawn from the ERIK-Surveys 2020.

At the federal state level, these conservative estimates for the ERIK-Surveys 2020 of directors, youth welfare offices and childcare providers vary between the following necessary sample sizes:

- › 204 (Bremen) to 370 (North Rhine-Westphalia) for the directors survey
- › 2 (Bremen) to 125 (North Rhine-Westphalia) for the youth welfare office survey
- › 95 (Bremen) to 339 (North Rhine-Westphalia) for the childcare providers survey

**Necessary sample sizes for family day-care workers vary greatly depending on the assumed cluster effect**

In contrast to simple random samples, more complex designs (like in the surveys of pedagogical staff and family day-care workers) must take into account the variances of clusters when estimating sample sizes (Israel 2012). When we make observations on subjects within clusters, the degree of similarity or correlation among within-cluster observations should be taken into account (Ahn/Heo/Zhang 2014). This is typically measured by

the intraclass correlation coefficient ( $icc$ ), which can assume a value of between 0 and 1:

- › When  $icc = 0$ , there is no correlation among observations within a cluster and the necessary sample size is the total number of observations across all clusters. The necessary sample sizes can in this case be calculated with the previous Formula 4.1.
- › If observations within a cluster are highly dependent (e.g.  $icc = 1$ ), then making another observation from the same cluster will not add information (ibid., p. 24). In this case, not the number of individuals but the number of clusters needed would have to be estimated to effectively draw valid and generalised conclusions for the clustered target populations in the 16 German federal states.

Thus, when we estimate the sample sizes for the ERIK-Surveys 2020 on pedagogical staff and family day-care workers, their clustering needs to be considered, since the subjects are nested within clusters or organisational entities that form groups (e.g. child day-care centres and youth welfare offices). When  $icc = 0$ , the necessary sample sizes for pedagogical staff and family day-care workers vary between:

- › 359 (Bremen) to 383 (North Rhine-Westphalia) for the pedagogical staff survey
- › 127 (Saxony-Anhalt) to 377 (North Rhine-Westphalia) for the family day-care workers survey

In contrast,  $icc = 1$  would change the necessary sample sizes needed to the previously mentioned necessary samples sizes of the organisational entities that the subjects are clustered in.

- › For the pedagogical staff survey, the sample size of the directors survey applies (ranging between 204 child day-care centres with information from pedagogical staff in Bremen to 370 in North Rhine-Westphalia).
- › In case of the family day-care workers survey, the sample size of the youth office survey applies (ranging between 2 youth welfare offices with information from family day-care workers in Bremen to 125 in North Rhine-Westphalia).

As the ERIK survey program covers a broad range of topics affecting the quality of ECEC, as defined

<sup>50</sup> For the ERIK-Surveys 2020, the size of the population ( $N$ ) at the federal level and per federal state was taken from the KJH statistics (Forschungsdatenzentren Der Statistischen Ämter Des Bundes Und Der Länder 2021) for directors, pedagogical staff, family day-care workers and youth welfare offices or, in case of childcare providers, from the commercially acquired sampling frame. In the calculations, we included a  $z$ -value ( $z = 1.96$ ) for an  $\alpha$  of 0.05, a conservative proportion value of  $p = 0.5$  and a margin of error of  $e = 5\%$  per state in relation to the respective population size.

in the KiQuTG (see Section 3.1 and Infobox 3.1), we cannot rule out that the perspectives within the target populations may vary extremely and none of these variations can be explained by the clusters (in an extreme case resulting in an  $icc$  of  $= 0$ ). We have therefore opted for higher sample size numbers calculated under the assumption of  $icc = 0$  in order to again be as conservative as possible in our assumptions.

However, these conservative estimates of the necessary sample size impose too many limitations on surveys, e.g. in terms of proportion and confidence intervals, which are neither necessary nor useful practically for the analysis of survey results.<sup>51</sup> For instance, all or nearly all youth welfare offices would need to participate in the respective survey in the 16 federal states to achieve these conservative sample size estimates.

**Samples of directors, youth welfare offices and providers are sufficiently sized in the majority of federal states**

In view of this dilemma, additional sample sizes were calculated for the target populations with  $z = 1.96$  (for an  $\alpha = 0.05$ ) and a larger sampling error of  $e = 0.1$ . The expected proportion value ( $p$ ) was taken from selected characteristics<sup>52</sup> of the respective sample. In addition to realistic effect sample sizes, the informative value (statistical power) of the ERiK-Surveys 2020 was discussed with experts in the field of ECEC. The outcome of these discussions was a decision that the informative value of some of the ERiK-Surveys 2020 in selected states should be considered limited. We distinguished between severe limitations, minor limitations and no limitations based on the criteria outlined hereafter.

Strong limitations apply if any of the following three conditions are met:

- › The number of complete interviews is below a threshold set jointly with ECEC experts specifically for each of the ERiK-Surveys

2020 ( $DIR \leq 75$ ;  $PST \leq 75$ ;  $FDW \leq 20$ ;  $YWO \leq 10$ ;  $PRO \leq 50$ ).<sup>53</sup>

- › Due to the small sample size, there is no variance on the selected characteristic in the federal state. The calculative necessary sample sizes (realistic) cannot be calculated because the variance of the selected characteristic is too low.
- › The number of complete cases is below the calculative necessary sample sizes (realistic) and the proportion of complete cases in the ERiK-Surveys 2020 relative to total population sizes ( $n/N$ ) is below a specific threshold set with the ECEC experts ( $DIR < 2\%$ ;  $PST < 0.5\%$ ;  $FDW < 5\%$ ;  $YWO < 50\%$ ;  $PRO < 10\%$ ).

Minor limitations are assumed when any of the following conditions apply:

- › The absolute number of valid cases for the selected characteristic is below the threshold value set with ECEC experts specifically for each of the ERiK-Surveys 2020 ( $DIR \leq 75$ ;  $PST \leq 75$ ;  $FDW \leq 20$ ;  $YWO \leq 10$ ;  $PRO \leq 50$ ).
- › The proportion of valid cases for the selected characteristic relative to total population sizes ( $n(\text{valid})/N$ ) is below a certain threshold set with the ECEC experts ( $DIR < 2\%$ ;  $PST < 0.5\%$ ;  $FDW < 5\%$ ;  $YWO < 50\%$ ;  $PRO < 10\%$ ).

**No limitations for the evaluation of federal states for the survey of pedagogical staff**

The resulting distribution is shown in detail in Table 4.3-1. The informative value should be considered strongly limited in:

- › Hamburg for the directors survey;
- › Berlin, Bremen, Saarland and Saxony-Anhalt for the family day-care workers survey;
- › Berlin, Bremen, Hamburg, Mecklenburg-Western Pomerania, Saarland, Saxony and Schleswig-Holstein for the youth welfare offices survey;
- › Bremen, Hamburg, Mecklenburg-Western Pomerania, Saarland, Saxony-Anhalt and Schleswig-Holstein for the childcare providers survey.

In the case of the survey of pedagogical staff, the informative value is not limited in any federal state.




<sup>51</sup> However, some scholars argue that if descriptive statistics are to be used, e.g. mean, frequencies, then nearly any sample size will suffice and only for multiple regression, analysis of co-variance, or log-linear analysis sample sizes between 200-500 are needed (Israel 2012).

<sup>52</sup> These selected characteristics were: (1) the proportion of male participants for the surveys of directors/pedagogical staff/family day-care workers, (2) the proportion of providers with vacant day-care places for the survey of providers and (3) the proportion of youth offices with less than 32 family day-care workers for the survey of youth offices.

<sup>53</sup> Abbreviations: DIR = Directors, PST = Pedagogical Staff, FDW = Family Day-Care Workers, YWO = Youth Welfare Offices, PRO = Providers.

Table 4.3-1: Federal and State Level Evaluations using the ERiK-Surveys 2020

	Directors	Pedagogical Staff	Family Day-Care Workers	Youth Offices	Providers
Baden-Wuerttemberg	No limitations	No limitations	No limitations	No limitations	No limitations
Bavaria	No limitations	No limitations	No limitations	No limitations	No limitations
Berlin	No limitations	No limitations	Minor limitations	Major limitations	Minor limitations
Brandenburg	No limitations	No limitations	No limitations	No limitations	No limitations
Bremen	No limitations	No limitations	Major limitations	Major limitations	Major limitations
Hamburg	Major limitations	No limitations	Minor limitations	Major limitations	Major limitations
Hesse	No limitations	No limitations	No limitations	No limitations	No limitations
Mecklenburg-Western Pomerania	No limitations	No limitations	Minor limitations	Major limitations	Major limitations
Lower Saxony	No limitations	No limitations	No limitations	No limitations	No limitations
North Rhine-Westphalia	No limitations	No limitations	No limitations	No limitations	No limitations
Rhineland-Palatinate	No limitations	No limitations	No limitations	No limitations	Minor limitations
Saarland	No limitations	No limitations	Major limitations	Major limitations	Major limitations
Saxony	No limitations	No limitations	No limitations	Major limitations	No limitations
Saxony-Anhalt	No limitations	No limitations	Major limitations	Minor limitations	Major limitations
Schleswig-Holstein	No limitations	No limitations	Minor limitations	Major limitations	Major limitations
Thuringia	No limitations	No limitations	No limitations	No limitations	Minor limitations
Germany	No limitations	No limitations	No limitations	No limitations	No limitations

 No limitations
  Minor limitations
  Major limitations

Minor limitations in informative value are assumed for:

- › Hamburg, Mecklenburg-Western Pomerania and Schleswig-Holstein for the family day-care workers survey;
- › Saxony-Anhalt for the youth welfare offices survey;
- › Berlin, Rhineland-Palatinate and Thuringia for the childcare providers survey.<sup>54</sup>

Thus, in these federal states, the sample may not have sufficient statistical power to detect meaningful effects and may not produce reliable answers to important research questions (Ahn/Heo/Zhang 2014). In Berlin, for example, nine of the

twelve youth welfare offices took part in the survey, which implies an extremely high response rate, but mean values and distribution measures could vary greatly if more youth welfare offices were surveyed. When evaluating the surveys for federal states with minor limitations, it is therefore advisable to always consider the dispersion of the parameters. In the case of federal states with strong sample limitations, survey results cannot be interpreted as valid representations of the situation in the respective state. While it is possible to interpret such results for the surveyed sample of respondents, the results may be strongly affected if additional respondents are added.

<sup>54</sup> The respective tables are included in the appendix (see Tables A.1-1, A.1-2, A.1-3, A.1-4 and A.1-5). The tables show the respective population sizes according to the child and youth welfare statistics 2020 (Forschungsdatenzentren Der Statistischen Ämter Des Bundes Und Der Länder 2021) or according to the commercial provider address list, the numbers of complete and valid questionnaires, the calculated conservative and realistic orientation values separately for each federal state.



# 5. Research Data of the ERiK-Surveys 2020

The data of the ERiK-Surveys 2020 will be made available to the scientific community in January 2023. In this chapter we describe

- › the general data structure (see Section 5.1) and
- › the data naming concept of the datasets and variables (see Section 5.2).

## 5.1 Structure of the Datasets

The structure of the datasets of the ERiK-Surveys 2020 results from the process of data generation. This is therefore explained before we introduce the datasets of the ERiK-Surveys 2020.

### Data Generation Process

A basic overview of the data generation process is depicted in Figure 5.1-1 and outlined in the following. As a first step in this process, programming templates were created. They contain information on the wording, succession and filtering of all questions and answers in the questionnaire as well as the naming and labeling of the resulting variables for each of the ERiK-Surveys 2020. This information was used by the survey institutes to generate the online and paper questionnaires. During the process of programming the online questionnaires, the information on which variables were combined on the same screen of the online instrument was stored in the screen table.

**Data structure of the ERiK-Surveys 2020 and the workflow for the entire data generation process are closely connected**

Before the survey institutes could start contacting institutions, samples had to be drawn from the sampling frames according to the sampling design. The samples drawn were stored in the sampling datasets. The survey institutes then contacted the institutions and documented this in the contact dataset. If addresses were updated during the fieldwork (e.g. via hotline responses or

through DJI research), these updates were compiled by the survey institutes and made available to the DJI separately in an updated address dataset after the fieldwork. General methodological information generated during the whole data generation process is stored in the gross datasets. The data collected with the questionnaires form the net datasets. In the two cases (surveys of directors and providers) where additional nonresponse surveys were conducted, the resulting data was stored in nonresponse datasets.

The data preparation (see Figure 5.1-1) started – in case of the net datasets – with the raw net datasets. These were edited by the survey institutes to comply with the specifications in the programming templates and delivered to the DJI. In cases where no raw datasets exist (contact, address update, gross datasets), the data preparation starts with the datasets delivered to the DJI by the survey institutes. The DJI then harmonised the datasets delivered across the different surveys and stored these in harmonised datasets. Subsequently, the research team generated variables on key characteristics for some core analyses.<sup>55</sup> Particular care was taken to proceed as consistently as possible across all surveys. The resulting variables were stored in one general dataset which includes all persons and institutions forming part of a gross or net dataset.

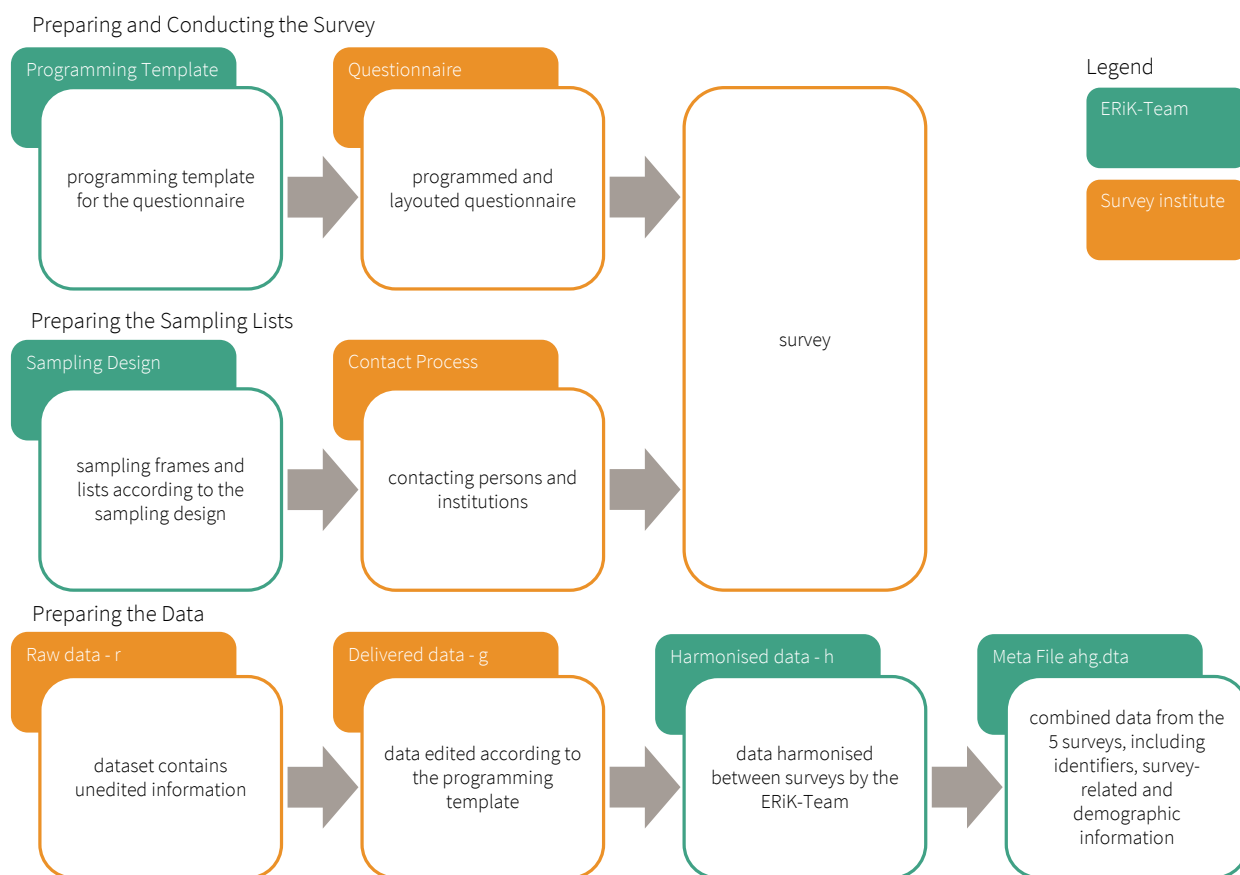
### Datasets

This section outlines the types of datasets that are generated in the ERiK-Project. Since every survey has some specific characteristics, some datasets (gross, contact, address update and nonresponse datasets) are organised slightly differently

<sup>55</sup> This was essentially limited to the net datasets.



Figure 5.1-1: Data Generation Process of the ERiK-Surveys 2020



between surveys. Figure 5.1-2 shows the available datasets (screen tables, net, address update, nonresponse, gross, contact and general datasets) and illustrates how they are related (see also Infobox 5.1). This is described in the following paragraphs.

### Infobox 5.1 Identifiers and Merging

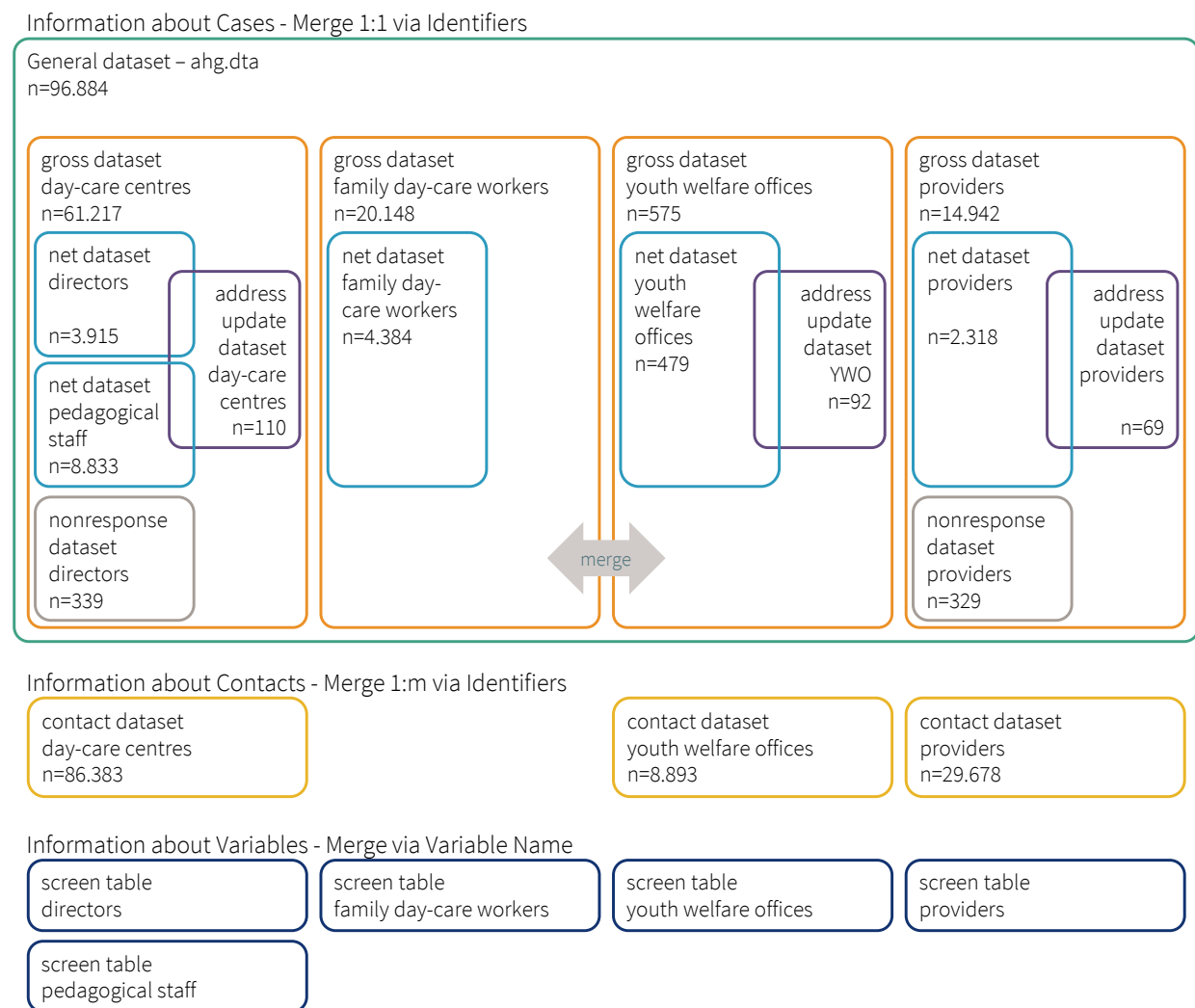
Because of the overall data structure with data on different observational levels, most analyses with the datasets of the ERiK-Surveys 2020 require the combination of datasets using merging procedures. Combination of the datasets is possible with the help of identifiers. The central individual identifier in the datasets of the ERiK-Surveys 2020 is \$id, which is fixed across datasets. The \$ sign represents the respective target population, e.g. the unique identifier for a youth office (j=Jugendamt) is called jid.

As Figure 5.1-2 indicates the gross, net, nonresponse and address update datasets of each population can be merged directly to the general dataset using a 1-to-1 merge procedure via these identifiers. Alternatively, the net datasets of pedagogical staff and directors can be merged directly using the identifier for centres 'eid'. Similarly, a direct merge of the net datasets of family day-care workers and youth offices using the youth office identifier 'jid' is also possible. Merging other net datasets – for example on regional level – is possible in principle, but has to be considered with caution. Merging of contact datasets to the general dataset requires a 1-to-many merge procedure. The methodological information on variables in the screen tables requires further processing of the information on variable level contained in the net datasets in order to be mergeable.

The *screen tables* provide information on which variables were surveyed on a common screen in



Figure 5.1-2: Overview of the Datasets for the ERiK-Surveys 2020



Note: Arrows in the graph imply that datasets can be merged (see Infobox 5.1).

the online mode. They are available for all five ERiK-Surveys 2020<sup>56</sup>. The first variable depicted on a screen is used to name each screen.

Each *net dataset* contains information on the people or institutions that completed the questionnaire at least partially (see Infobox 3.2). The datasets contain the following information: identifiers (see Infobox 5.1), responses of the respondents in the form of variables, additional information about the answering of the questionnaires (duration, timestamps per screen), weights and a survey mode variable. The variables are roughly ordered according to the sequence in the questionnaire, with the duration variables placed directly after the corresponding substantive vari-

ables. The labels of the substantive variables contain a summary of the question text in German, limited to approx. 80 characters. Net datasets are available for all five ERiK-Surveys 2020.

The survey institutes stored updated addresses for the day-care centres, youth welfare offices and childcare providers. As the institute surveying family day-care workers was not allowed to store any of their addresses, there is no *address update dataset* for this group of respondents. The address update datasets only include institutions that are part of the gross sample.

Parts of the nonresponding day-care centres and childcare providers were sampled in two nonresponse-surveys. The *nonresponse datasets* (Gedon et al. 2021c) include all information connected to these surveys, like identifiers, responses

<sup>56</sup> The nonresponse surveys are treated as special additional datasets to the respective main survey and not as separate surveys.

of the respondents, additional methodological information on interviewer characteristics and contact attempts.

The *gross datasets* provide available information on all persons and institutions which should be contacted (see Section 3.4). They are based on the sample datasets that the survey institutes received from the DJI. The gross datasets include the following information:

1. Identifiers that match the identifier of the final record in the net datasets in the case of completed and partial questionnaires and that identify the selected institution from the sampling datasets in all other cases (see Infobox 5.1).
2. Regional data, such as federal state, municipality code, district code and categorised number of people living in the municipality.
3. Variables documenting the fieldwork (e.g. dates, response codes according to the American Association for Public Opinion Research (2016), tranche/subsample indicator according to the sampling design, a survey mode variable).

#### **Gross datasets provide information on all persons or institutions contacted**

Since the sample of pedagogical staff is dependent on the samples of directors (see Schacht et al. 2021b), the gross dataset for centres consists of data for each centre and its pedagogical staff in the sample. The gross dataset for youth welfare offices contains information on each youth office in the sample as well as information on the agreement about how, when and which shares of family day-care workers were to be contacted by youth welfare offices in their respective districts. Thus, any information available on contacting the family day-care workers is to be found in the youth office gross data. A gross dataset containing information on all providers which should be contacted is also available.

The *contact datasets* include all institutions<sup>57</sup> that were contacted by the survey institutes, which can be identified in all datasets via identifiers (see Infobox 5.1). The contact datasets

contain the following information: documentation of contact attempts (date, contact mode, resulting response codes of the contact according to American Association for Public Opinion Research 2016). In addition, the datasets include information on the contact person, e.g. whether it was the director or deputy of a youth welfare office or the director of a day-care centre or a different person. The contact datasets are stored in a spell format. This means that a separate observation is created for each contact of each institution or person. In order to identify each contact attempt, a spell identifier is included in the contact datasets. In contrast to other identifiers, the spell identifier cannot be used to merge datasets. Contact datasets are available for day-care centres, youth offices and providers. Contact information for directors and pedagogical staff is only available on the level of day-care centres. There is no specific contact dataset for family day-care workers. As mentioned above, all information about the contacting process is stored on the youth office level in the respective gross dataset. The contact dataset for youth offices is thus limited to information regarding the survey institutes' attempts in contacting the youth offices.

#### **The general dataset is a convenient starting point for analysing the data of the ERiK-Surveys 2020**

The *general dataset* contains all persons or institutions listed in the net or gross datasets. Beside the generated variables on key characteristics for core analyses, it includes some other key variables as well (e.g. mode of data collection, AAPOR code). Since it also contains the identifier (see Infobox 5.1) of every person and institution, each of the other datasets (e.g. gross, net, nonresponse datasets) with the exception of the screen tables can easily be matched to this dataset. Therefore, the general dataset is a convenient starting point for analysing the data of the ERiK-Surveys 2020.

### **Overview of the Variables in the Net Datasets**

After explaining the structure and the relationship between the different data sets, the focus is placed on the net datasets, as these are the central datasets of the project that provide substantive information on quality aspects of the ECEC system.

<sup>57</sup> Persons were only contacted indirectly in the case of directors/pedagogical staff (via the day-care centres) and the family day-care workers (via the youth offices).

Table 5.1-1: Variables in the Net Datasets of the ERiK-Surveys 2020

	DIR		PST		FDW		YWO		PRO	
	no.	%	no.	%	no.	%	no.	%	no.	%
No. of variables according to programming template	428	100	283	100	390	100	302	100	396	100
- Assigned to KiQuTG	400	93	225	80	280	72	265	88	281	71
» Measured from more than one perspective	242	61	163	72	178	64	197	74	270	96
» Measured from one perspective	155	39	62	28	102	36	62	23	11	4
- Not assigned to KiQuTG	28	7	58	20	110	28	37	12	115	29
- Measured identically in at least two questionnaires	43	10	79	28	64	16	25	8	34	9

Note: Abbreviations: DIR = Directors, PST = Pedagogical Staff, FDW = Family Day-Care Workers, YWO = Youth Welfare Offices, PRO = Providers.  
Source: DJI, ERiK-Surveys 2020

As the five ERiK-Surveys 2020 target at different populations, the structure of variables also varies between the survey-specific net datasets (see Table 5.1-1).

Each of the net datasets of directors, family day-care workers and providers consists of around 400 variables. Based on the questionnaires of the pedagogical staff and youth welfare offices, about 300 variables are included in each of these net datasets.

**At least 61 % of variables in net datasets represent indicators that are measured in two or more populations**

Table 5.1-1 shows the structure of variables in the net datasets of the ERiK-Surveys 2020. The variables are first classified according to whether they measure indicators defined in the KiQuTG or not. The variables that measure such indicators are further differentiated according to whether the indicator is measured in several ERiK-Surveys or whether data is only available from one perspective. The variables correspond to a high extent (between 71 % in the provider survey and 93 % in the directors survey) with indicators representing the fields of action which are defined in the KiQuTG (see Infobox 3.1). The other variables are for example demographic or weighting variables. The majority of those variables assigned to the KiQuTG belongs to indicators that are assessed from the perspectives of multiple ECEC actors. Questions about these indicators were thus asked in at least 2 surveys each. Between 61 % (directors) and 96 % (providers) of all variables are such multi-perspective variables. For example, the surveys of directors, pedagogical staff and providers asked who was involved in the

design of the rooms. Thus, the involvement in room design was measured from three perspectives. A significant share (between 8 % in the youth office survey and 28 % in the pedagogical staff survey) of variables is measured identically in at least two different surveys.

## 5.2 Data Naming Concept

**Variables and datasets are named according to a structured concept**

In order to manage datasets and variables systematically, they have to be named following a structured concept. The data naming concept used for the datasets of the ERiK-Survey 2020 comprises the following components:

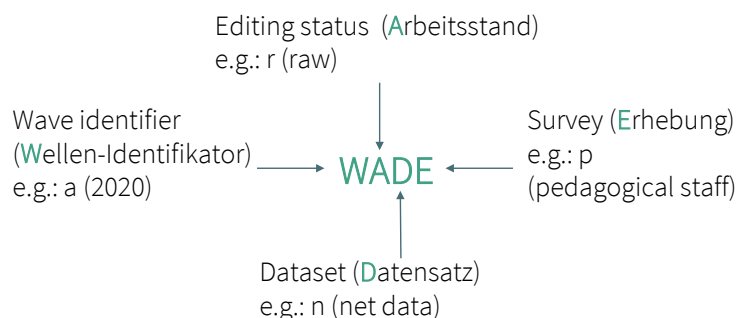
- › For datasets: Wave, editing status, dataset type and survey
- › For variables: Questions, items and a marker for open-ended questions

In the following two sections both concepts are described in detail.

### Naming of Datasets

Each dataset name of the ERiK-Surveys 2020 is composed of four digits. The individual digits identify different properties of the datasets. For example, the dataset name 'arnp' stands for the first wave (a), unedited raw (r) net (n) dataset from the pedagogical staff survey (p). The four elements can be summarised in what we have termed 'WADE Concept' (see Figure 5.2-1). Each of the letters assigned to the naming categories is based on a German word and therefore does not necessarily correspond to the English term. The following paragraph shows which property the

Figure 5.2-1: Components of the Data Naming Concept for the ERIK-Surveys 2020



individual element represents and which values it can have.

- › 1st letter *W* in our naming concept – Wave identifier (in German: Welle): The first identifier in the dataset name is the wave starting with ‘a’ for the surveys conducted in 2020. The label ‘b’ denotes the wave that will be conducted in 2022.
- › 2nd letter *A* in our naming concept – Editing status of the datasets (in German: Arbeitsstand): The second identifier in the dataset name is the abbreviation for the status of the data editing process. Here, the following three distinctions are made:
  1. Unedited data (r – raw): These datasets contain the unedited information provided by respondents.
  2. Delivered (g – in German: ‘geliefert’): This data has been edited by the survey institutes and delivered to the DJI.
  3. Harmonised (h): This data has been harmonised by the DJI.

Raw datasets are only available for net datasets (for the process of data editing see Section 5.1 and Figure 5.1-1).
- › 3rd letter *D* in our naming concept – Type of dataset (in German: Datentyp): The dataset type is noted in the third position of the dataset name and is divided into the following seven categories as described in Section 5.1 and depicted in Figure 5.1-2:
  1. Net datasets (n – in German: ‘Netto’): Only contain the persons or institutions actually participating. In contrast,
  2. Gross datasets (b – in German: ‘Brutto’) and
  3. Contact datasets (k – in German: ‘Kontakt’): Contain all institutions that were contacted.
  4. Address update datasets (a – in German: ‘Adressaktualisierung’): Consist only of those institutions whose addresses have been updated in the field.
  5. Nonresponse data (r): Collected from a subsample of persons who did not participate in the regular main survey.
  6. Screen data (s): Indicates at the variable level which variable was surveyed on which screen of the online instrument.
  7. General dataset (g): Includes all persons or institutions forming part of a gross or a net dataset.
- › 4th letter *E* in our naming concept – Survey (in German: Erhebung): A letter is assigned to each survey as the fourth identifier. The populations are denoted as follows:
  1. Directors = ‘l’ (in German: Leitungen)
  2. Pedagogical staff = ‘p’ (in German: pädagogisches Personal)
  3. Day-care centres = ‘e’ (in German: Einrichtungen)
  4. Family day-care workers = ‘k’ (in German: Kindertagespflegepersonen)
  5. Youth welfare offices = ‘j’ (in German: Jugendämter)
  6. Providers of childcare = ‘t’ (in German: Träger)

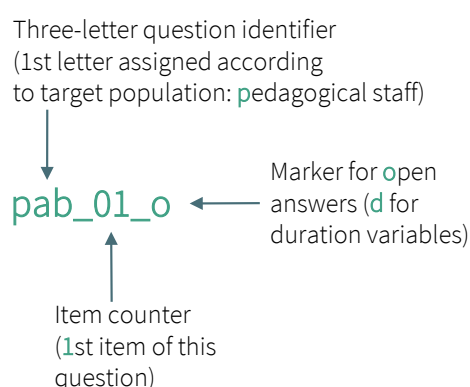
In the case of the populations surveyed in the day-care centres (directors and pedagogical staff), the letter ‘e’ for the day-care centres (in German: Einrichtungen) is employed in some cases. It is used instead of ‘l’ and ‘p’ if a dataset contains data for both populations (e.g. the gross and contact datasets include information on both: directors and pedagogical staff). The general dataset is a special case in the WADE concept: It is named only with three letters since it is not assigned to any specific

population. It is named ahg ('a' = wave a 2020; 'h' = harmonised; 'g' = general dataset) and includes all persons and institutions forming part of a gross or net dataset in wave a. The dataset contains generated variables in addition to identifiers and basic characteristics.

## Naming of Variables

There are two different types of variables in our datasets: variables that are provided by the two survey institutes and variables generated by the DJI. Both types of variables are named in the process of preparing the data (see Figure 5.1-1). In the last two steps of the process (depicted in turquoise), the variables are generated by the DJI. Descriptive names are used for these generated variables. For the variables the survey institutes created in the first two steps (depicted in orange), the naming follows certain rules outlined in the following paragraph and illustrated in Figure 5.2-2.

Figure 5.2-2: **Variable Naming Concept: Example**



The first element is a three-letter question identifier (pab in the example). To provide some orientation on the origin of the variable, the first letter of the three-letter question identifier is assigned according to target population or content criteria. In the example, the variable pab\_01\_o

stems from the survey of pedagogical staff and is thus given a variable name beginning with 'p', whereas variable names in the provider survey would usually begin with a 't' (in German: Träger). Letters have been selected in accordance with the respective survey identifiers in the dataset (see Section 5.2). Table 5.2-1 provides an overview of the abbreviations. If a variable represents interviewer characteristics, its name begins with 'i'. Variables in the gross dataset usually start with 'b'. The second and third letters (ab in the example) of the question identifier were allocated in alphabetical order roughly following the order in the questionnaire. If a question consists of multiple items, a number is added to the question identifier (e.g. pab\_01 or aaa\_02). Open answers are marked by an additional '\_o' at the end of the variable name (e.g. paba\_01\_o or aaa\_o). If the text (question, item, note and answer categories) of a question is identical across different surveys or waves, the identical variable name is assigned. For example, the question on the employment status of directors and pedagogical staff is stored in the variable 'paa' in both surveys.

Table 5.2-1: **Variable Naming Concept: Abbreviations**

Origin of Variable	Abbreviation
<b>Substantive Variables</b>	
Directors	l
Pedagogical Staff	p
Family Day-Care Workers	k
Youth Welfare Offices	j
Childcare Providers	t
Sociodemographic Information	a
<b>Technical Variables</b>	
Spell variables in the Contact Dataset	s
Interviewer Characteristics	i
Net Dataset	n
Gross Dataset	b
Nonresponse Dataset	r





## 6. Summary

The aim of the Methodological Report II was to describe the survey concept of the ERiK-Surveys 2020 and its implementation as well as to evaluate the data collection with regard to its quality. Attention was paid to some core features of the survey quality such as the sampling strategy, the response rates, the weighting and the selectivity. It is assumed that generalisable statements about the framework conditions in child day-care from different perspectives are possible on the basis of the datasets of the ERiK-Surveys 2020. Data users should consider the following aspects:

- › The informative value based on the ERiK-Surveys 2020 is limited with regard to point and population estimators in selected federal states and surveys. Even though the ERiK-Surveys 2020 have achieved very high sample sizes compared to previous studies, the sample sizes, but also the underlying populations, are sometimes too small for state-level analyses (see Section 4.3). Also, we cannot exclude a small correlation between nonresponse and those indicators of the KiQuTG (see Infobox 3.1) that are the research foci of the study. This problem is aggravated by the fact that the correlation between nonresponse and the KiQuTK indicators cannot be fully investigated due to lacking complete sampling frames and official statistics for some of the populations investigated by the ERiK-Surveys 2020.
- › Using the data from the ERiK-Surveys 2020, generalised statements can be made about the target populations if these are weighted and the complex sample design is considered (for example in Stata via the `svyset`<sup>58</sup> command package). A critical evaluation of the absolute number of cases and the data dispersion, e.g. using the standard error (or a comparable

measure), before running and publishing estimations based on the ERiK-Surveys 2020 is advisable in order to take the estimate's uncertainty into account.

- › Data users will be able to access the datasets of the ERiK-surveys 2020 via the Research Data Centre of the German Youth Institute (FDZ-DJI, [www.surveys.dji.de](http://www.surveys.dji.de)) from January 2023 onwards. In this research report, the data was evaluated as of August 2021. Further revisions of the data, such as the addition of further relevant generated variables to the data, cannot be ruled out at this point. In this respect, data users should note any versioning of the data. The corresponding citation of the data portfolio and the data sets of the ERiK Surveys 2020 is summarised in the last row of the study synopsis (see Table 6.0-2).

These limitations are considered in the ERiK Research Report II (Klinkhammer et al. 2021a) and in the descriptive overview of some characteristics for the present samples in Table 6.0-1. It depicts some characteristics of the different ERiK-Surveys 2020 and compares them weighted and unweighted. This shows the differences and may help data users to follow and replicate the process. In this respect, they serve as points of orientation for the users of the ERiK-Surveys 2020.

Finally, the following study synopsis summarises some basic information for the ERiK-Surveys 2020 (Table 6.0-2).

58 For the analyses in the ERiK Research Report II (Klinkhammer et al. 2021a) the following weighting structure was used: At first the survey design with the appropriate strata (if necessary), finite population correction (if necessary) and weight was declared for the dataset using the 'svyset' command. Depending on the population analysed, one of the following commands was used:

- Centres: `svyset eid [pweight=nwe], strata(gca) fpc(fpc_l)`
- Directors: `svyset eid [pweight=nwl], strata(gca) fpc(fpc_l)`

- Pedagogical Staff: `svyset eid [pweight=nwp], strata(gca) || pid`
- Family Day-Care Workers: `svyset jid [pweight=nww] || kid`
- Youth Offices: `svyset [pweight=nww]`
- Providers: `svyset [pweight=nwn]` (for analyses on provider level) `svyset [pweight=nww]` (for analyses on centre level).

In a second step the actual analysis was then executed with the prefix 'svy'. For example: `svy: tabulate gaf, col count`.



Table 6.0-1: **Descriptive Overview ERIK-Surveys 2020**

	Directors		Pedagogical Staff		Family Day-Care Workers		Youth Offices		Providers	
	unweighted	weighted	unweighted	weighted	unweighted	weighted	unweighted	weighted	unweighted	weighted
Female	94	95	94	94	96	96	.	.	72	71
Full-time*	61	58	40	40	30	24	.	.	.	.
Public provider	35	34	35	36	25	28	.	.	38	34
Questionnaire answered by one person	.	.	.	.	.	.	30	30	73	75
Other people present while answering the questionnaire	10	10	25	23	9	9	.	.	24	22
Highest vocational degree:	-	-	-	-	-	-	-	-	-	-
Educator	72	74	77	67	13	12	.	.	20	21
Social pedagogue/worker	13	12	3	2	2	1	.	.	20	18
Nursery nurse	0	0	7	14	6	5	.	.	0	0
Administrative/office professions	0	0	0	0	14	17	.	.	32	32
Other/no degree	15	14	12	17	64	65	.	.	28	29
Means with standard errors in parantheses										
Age of respondent (in years)	49.1 (0.17)	49.1 (0.18)	40.9 (0.13)	40.2 (0.19)	47.7 (0.16)	47.7 (0.26)	.	.	48.8 (0.26)	49.0 (0.28)
No. : of children (DIR, CEN), of FDW (WVO), of centres (PST)	75.6 (0.81)	69.9 (0.73)	.	.	.	.	82.4 (5.31)	80.0 (4.93)	7.4 (0.68)	6.1 (0.84)

Notes: \*Full-time = contractual weekly working hours of 38.5+ hours. The case numbers for FDW are very low for 'full-time' (n=122) and 'public providers' (n=124), presumably because most do not have an official contract. Using the actual weekly working hours instead of the contractual ones results in 56 % full-time FDW (n=3317) (unweighted: 61 %; n=3493). Abbreviations: S.E. = Standard error, CEN = Centres, DIR = Directors, PST = Pedagogical Staff, FDW = Family Day-Care Workers, WVO = Youth Welfare Offices, PRO = Providers.

Source: DJI, ERIK-Surveys 2020; unweighted and weighted data; n: DIR: 3554-3867; PST: 7789-8714; FDW: 122-4384; WVO: 333-575; PRO: 1613-2318

Table 6.0-2: **Study Synopsis ERIK-Surveys 2020**

Field time main survey	April to September 2020
Population	Youth welfare offices (YWO), family day-care workers (FDW), childcare providers (PRO) and directors (DIR) and pedagogical staff (PST) in child day-care institutions
Target/interviewees	<ul style="list-style-type: none"> <li>– YWO/PRO: heads of department, deputy heads, one or more staff members</li> <li>– DIR: management, deputy, part of the management team</li> <li>– PST/FDW: selected persons</li> </ul>
Survey institutes	<ul style="list-style-type: none"> <li>– DIR, PST: infas Institute for Applied Social Sciences</li> <li>– FDW, YWO, PRO: SOKO Institute for Social Research and Communication</li> </ul>
Survey instruments	<ul style="list-style-type: none"> <li>– Paper postal self-completion and access to the online version of the questionnaire (P&amp;O)</li> <li>– Access to the online version of the questionnaire (O)</li> </ul>
Contact and contact possibility for target persons	<ul style="list-style-type: none"> <li>– Target population-specific cover letter with information on study and data protection, postal reminder and telephone reminder (incl. nonresponse survey (for PRO, DIR))</li> <li>– Information telephone number and study-specific e-mail address of the survey institutes</li> </ul>
Gross sample (GS), Achieved sample size/net cases (NC) and response rate (RR)	<ul style="list-style-type: none"> <li>– DIR: GS: 13,200; NC: 3,915, of which 3,867 complete (RR: 33 %)</li> <li>– PST: GS: 47,500; NC: 8,833, of which 8,714 complete (RR: 19 %)</li> <li>– FDW: GS: 20,100; NC: 4,384, of which 3,704 complete (RR: 20 %)</li> <li>– YWO: GS: 575; NC: 479, of which 381 complete (RR: 83 %)</li> <li>– PRO: GS: 14,900; NC: 2,318, of which 1,902 complete (RR: 16 %)</li> </ul>
Weighting	<ul style="list-style-type: none"> <li>– Design weighting for DIR, PST, FDW (YWO and PRO are complete surveys)</li> <li>– Nonresponse weighting using logistic regression models at DIR, PST, YWO, PRO</li> <li>– Calibration/adjustment weighting at DIR, PST, FDW, YWO and PRO (PRO at institution level)</li> </ul>
Citation of data	<ul style="list-style-type: none"> <li>– Total dataset for the ERIK-Surveys 2020: Gedon, Benjamin/Schacht, Diana D./Gilg, Jakob J./Buchmann, Janette/Drexler, Doris/Hegemann, Ulrike/Kuger, Susanne/Müller, Michael/Preuß, Melina/Ulrich, Lisa/Wenger, Felix (2021a): ERIK-Surveys 2020. German Youth Institute (DJI). Dataset Version 1.0.0. <a href="https://doi.org/10.17621/erik2020">https://doi.org/10.17621/erik2020</a>.</li> <li>– Survey specific datasets: DIR: Gedon et al. (2021b); PST: Gedon et al. (2021d); FDW: Gedon et al. (2021f); YWO: Gedon et al. (2021e); PRO: Gedon et al. (2021g)</li> <li>– Nonresponse surveys: Gedon et al. (2021c)</li> </ul>

**Note:** Abbreviations: CEN = Centres, DIR = Directors, PST = Pedagogical Staff, FDW = Family Day-Care Workers, YWO = Youth Welfare Offices, PRO = Providers.



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## A. Appendix



## A.1 Limitations

Table A.1-1: **Limitations of the Informative Value in the Survey of Directors**

Federal state	Case counts and conservative estimation of the ideal sample size				Estimation of the ideal sample size for the proportion of males			
	N	n_complete	n_complete/ N (%)	n_ideal (conservative)	n_response	prop_male	n_response/ N (%)	n_ideal (realistic)
Baden-Wuerttemberg	8,878	434	4.9	368	431	0.03	4.9	13
Bavaria	8,766	495	5.6	368	492	0.03	5.6	10
Berlin	2,663	149	5.6	336	148	0.09	5.6	33
Brandenburg	1,565	212	13.5	308	209	0.08	13.4	27
Bremen	437	90	20.6	204	88	0.11	20.1	36
Hamburg	1,126	57 <sup>b</sup>	5.1	286	57	0.11	5.1	35
Hesse	4,157	292	7.0	352	288	0.05	6.9	18
Mecklenburg-Western Pomerania	952	138	14.5	274	135	0.07	14.2	26
Lower Saxony	5,045	302	6.0	357	298	0.05	5.9	17
North Rhine-Westphalia	10,347	442	4.3	370	440	0.04	4.3	16
Rhineland-Palatinate	2,470	302	12.2	332	300	0.07	12.1	25
Saarland	470	83	17.7	211	83	0.10	17.7	31
Saxony	2,348	279	11.9	330	277	0.07	11.8	25
Saxony-Anhalt	1,414	176	12.4	302	174	0.03	12.3	13
Schleswig-Holstein	1,774	205	11.6	316	202	0.10	11.4	34
Thuringia	1,330	211	15.9	298	209	0.05	15.7	17
Germany	53,742	3867	7.2	381	3831	0.06	7.1	22

Notes: N = the size of the population; n\_complete = number of complete questionnaires; n\_ideal = number of necessary cases to detect differences under the assumptions listed in Section 4.3; n\_response = number of valid responses to the question on gender; prop\_male = proportion of respondents who classify themselves as male. Thresholds: n/N < 2 %; n < 75. <sup>a</sup> Reason for minor limitations; <sup>b</sup> Reason for major limitations.

Source: DJI, ERIK-Surveys 2020; Research Data Centre of the Statistical Offices of the Federal States, Statistik der Kinder- und Jugendhilfe, Kinder und tätige Personen in Tageseinrichtungen und in öffentlich geförderter Kindertagespflege, 2020

Table A.1-2: **Limitations of the Informative Value in the Survey of Pedagogical Staff**

Federal state	Case counts and conservative estimation of the ideal sample size				Estimation of the ideal sample size for the proportion of males			
	N	n_complete	n_complete/ N (%)	n_ideal (conservative)	n_response	prop_male	n_response/ N (%)	n_ideal (realistic)
Baden-Wuerttemberg	95,879	952	1.0	383	946	0.04	1.0	16
Bavaria	102,280	1,212	1.2	383	1,206	0.03	1.2	11
Berlin	32,196	247	0.8	380	243	0.12	0.8	39
Brandenburg	21,986	511	2.3	378	503	0.09	2.3	32
Bremen	5,510	185	3.4	359	183	0.09	3.3	30
Hamburg	16,416	98	0.6	375	98	0.12	0.6	41
Hesse	50,337	739	1.5	381	732	0.05	1.5	17
Mecklenburg-Western Pomerania	12,331	309	2.5	373	307	0.08	2.5	28
Lower Saxony	58,683	703	1.2	382	697	0.05	1.2	18
North Rhine-Westphalia	116,037	908	0.8	383	901	0.05	0.8	20
Rhineland-Palatinate	32,196	767	2.4	380	760	0.06	2.4	20
Saarland	6,519	229	3.5	363	229	0.05	3.5	19
Saxony	34,995	518	1.5	380	506	0.06	1.4	21
Saxony-Anhalt	18,139	394	2.2	376	388	0.04	2.1	13
Schleswig-Holstein	20,248	476	2.4	377	471	0.08	2.3	27
Thuringia	14,578	466	3.2	374	463	0.05	3.2	19
Germany	638,330	8,714	1.4	384	8,633	0.06	1.4	22

Notes: N = the size of the population; n\_complete = number of complete questionnaires; n\_ideal = number of necessary cases to detect differences under the assumptions listed in Section 4.3; n\_response = number of valid responses to the question on gender; prop\_male = proportion of respondents who classify themselves as male. Thresholds: n/N < 0.5 %; n < 75. <sup>a</sup> Reason for minor limitations; <sup>b</sup> Reason for major limitations.

Source: DJI, ERIK-Surveys 2020; Research Data Centre of the Statistical Offices of the Federal States, Statistik der Kinder- und Jugendhilfe, Kinder und tätige Personen in Tageseinrichtungen und in öffentlich geförderter Kindertagespflege, 2020

Table A.1-3: **Limitations of the Informative Value in the Survey of Family Day-Care Workers**

Federal state	Case counts and conservative estimation of the ideal sample size				Estimation of the ideal sample size for the proportion of males			
	N	n_complete	n_complete/ N (%)	n_ideal (conservative)	n_response	prop_male	n_response/ N (%)	n_ideal (realistic)
Baden-Wuerttemberg	7,814	495	6.3	366	518	0.04	6.6	14
Bavaria	4,431	307	6.9	354	314	0.03	7.1	11
Berlin	2,261	45	2.0	328	44	0.16	1.9	50 <sup>b</sup>
Brandenburg	991	45	4.5	277	51	0.04	5.1	14
Bremen	314	25	8.0	173	26	1.00 <sup>b</sup>	8.3	
Hamburg	1,250	49	3.9	294	50	0.06	4.0 <sup>a</sup>	21
Hesse	3,072	245	8.0	341	248	0.05	8.1	18
Mecklenburg-Western Pomerania	1,251	58	4.6	294	59	0.03	4.7 <sup>a</sup>	12
Lower Saxony	7,614	574	7.5	366	591	0.03	7.8	10
North Rhine-Westphalia	19,960	1,618	8.1	377	1,609	0.04	8.1	15
Rhineland-Palatinate	1,505	122	8.1	306	138	0.04	9.2	13
Saarland	368	4 <sup>b</sup>	1.1 <sup>b</sup>	188	4	1.00 <sup>b</sup>	1.1	
Saxony	1,698	173	10.2	313	174	0.05	10.2	17
Saxony-Anhalt	190	12 <sup>b</sup>	6.3	127	12	1.00 <sup>b</sup>	6.3	
Schleswig-Holstein	1,837	73	4.0	318	75	0.03	4.1 <sup>a</sup>	10
Thuringia	280	30	10.7	162	32	0.03	11.4	11
Germany	54,836	3,875	7.1	381	3,945	0.05	7.2	18

Notes: N = the size of the population; n\_complete = number of complete questionnaires; n\_ideal = number of necessary cases to detect differences under the assumptions listed in Section 4.3; n\_response = number of valid responses to the question on gender; prop\_male = proportion of respondents who classify themselves as male. Thresholds: n/N < 5 %; n < 20. <sup>a</sup> Reason for minor limitations; <sup>b</sup> Reason for major limitations.

Source: DJI, ERIK-Surveys 2020; Research Data Centre of the Statistical Offices of the Federal States, Statistik der Kinder- und Jugendhilfe, Kinder und tätige Personen in Tageseinrichtungen und in öffentlich geförderter Kindertagespflege, 2020

Table A.1-4: **Limitations of the Informative Value in the Survey of Youth Offices**

Federal state	Case counts and conservative estimation of the ideal sample size				Estimation of the ideal sample size for the proportion of Youth Offices with less than 32 family day-care workers			
	N	n_complete	n_complete/ N (%)	n_ideal (conservative)	n_response	prop_nfdw32	n_response/ N (%)	n_ideal (realistic)
Baden-Wuerttemberg	46	33	71.7	41	33	0.06	71.7	15
Bavaria	96	63	65.6	77	54	0.57	56.3	48
Berlin	12	9 <sup>b</sup>	75.0	12	7	0.29	58.3	11
Brandenburg	18	11 <sup>a</sup>	61.1	17	11	0.55	61.1	15
Bremen	2	1 <sup>b</sup>	50.0	2	1	1.00 <sup>b</sup>	50.0	
Hamburg	7	4 <sup>b</sup>	57.1	7	5	0.40	71.4	7
Hesse	33	18	54.5	30	20	0.05	60.6	12
Mecklenburg-Western Pomerania	8	2 <sup>b</sup>	25.0 <sup>b</sup>	8	2	0.50	25.0	7 <sup>b</sup>
Lower Saxony	54	37	68.5	47	36	0.03	66.7	9
North Rhine-Westphalia	186	127	68.3	125	113	0.22	60.8	49
Rhineland-Palatinate	41	26	63.4	37	24	0.38	58.5	28
Saarland	6	4 <sup>b</sup>	66.7	6	3	0.67	50.0	6
Saxony	13	8 <sup>b</sup>	61.5	13	8	0.13	61.5	10
Saxony-Anhalt	14	11	78.6	14	9 <sup>a</sup>	0.89	64.3	10
Schleswig-Holstein	16	6	37.5 <sup>b</sup>	15	6	0.33	37.5	14 <sup>b</sup>
Thuringia	23	21	91.3	22	19	0.89	82.6	14
Germany	575	381	66.3	230	351	0.32	61.0	73

Notes: N = the size of the population; n\_complete = number of complete questionnaires; n\_ideal = number of necessary cases to detect differences under the assumptions listed in Section 4.3; n\_response = number of valid responses to the question on the number of family day-care workers in the youth office district; prop\_nfdw32 = proportion of youth offices with less than 32 family day-care workers. Thresholds: n/N < 50 %; n < 10. <sup>a</sup> Reason for minor limitations; <sup>b</sup> Reason for major limitations.

Source: DJI, ERIK-Surveys 2020; Research Data Centre of the Statistical Offices of the Federal States, Statistik der Kinder- und Jugendhilfe, Kinder und tätige Personen in Tageseinrichtungen und in öffentlich geförderter Kindertagespflege, 2020



Table A.1-5: **Limitations of the Informative Value in the Survey of Providers**

Federal state	Case counts and conservative estimation of the ideal sample size				Estimation of the ideal sample size for the proportion of providers with vacant day-care places			
	N	n_complete	n_complete/N (%)	n_ideal (conservative)	n_response	prop_vacant	n_response/N (%)	n_ideal (realistic)
Baden-Wuerttemberg	2,814	338	12.0	338	314	0.44	11.2	92
Bavaria	1,967	300	15.3	321	280	0.31	14.2	79
Berlin	270	53	19.6	159	47 <sup>a</sup>	0.25	17.4	57
Brandenburg	540	69	12.8	225	61	0.49	11.3	82
Bremen	126	23 <sup>b</sup>	18.3	95	23	0.15	18.3	36
Hamburg	200	24 <sup>b</sup>	12.0	132	24	0.26	12.0	54
Hesse	893	140	15.7	269	128	0.35	14.3	79
Mecklenburg-Western Pomerania	529	46 <sup>b</sup>	8.7	223	47	0.53	8.9	81
Lower Saxony	1,197	153	12.8	291	142	0.27	11.9	70
North Rhine-Westphalia	2,917	336	11.5	339	306	0.07	10.5	25
Rhineland-Palatinate	1,343	136	10.1	299	119	0.40	8.9 <sup>a</sup>	87
Saarland	146	22 <sup>b</sup>	15.1	106	21	0.60	14.4	57
Saxony	644	109	16.9	241	108	0.55	16.8	83
Saxony-Anhalt	455	49 <sup>b</sup>	10.8	208	48	0.50	10.5	79
Schleswig-Holstein	291	41 <sup>b</sup>	14.1	166	36	0.08	12.4	26
Thuringia	605	62	10.2	235	56	0.55	9.3 <sup>a</sup>	82
Germany	14,937	1,901	12.7	375	1,760	0.33	11.8 <sup>a</sup>	84

Notes: N = the size of the population; n\_complete = number of complete questionnaires; n\_ideal = number of necessary cases to detect differences under the assumptions listed in Section 4.3; n\_response = number of valid responses to the question on vacant day-care places; prop\_vacant = proportion of providers with vacant day-care places. Thresholds: n/N < 10 %; n < 50. <sup>a</sup> Reason for minor limitations; <sup>b</sup> Reason for major limitations.

Source: DJI, ERIK-Surveys 2020

# ERiK-Methodological Report II

## Implementation, Data Quality and Data Structure of the ERiK-Surveys 2020

The ERiK-Methodological Report II is the second methodological report in the study ‘Entwicklung von Rahmenbedingungen in der Kindertagesbetreuung – indikatorengestützte Qualitätsbeobachtung (ERiK)’. The report introduces the implementation of the sample and survey designs, evaluates the data quality and introduces the datasets of the ERiK-Surveys 2020. Together with the ERiK-Methodological Report I, it contains all background information on the ERiK-Surveys 2020.

### **Researching children, youth and families at the intersection of science, policy, and professional practice**

The German Youth Institute (DJI) is one of the largest social science research institutes in Europe with an experience of over 50 years. The DJI conducts empirical studies into the life situations of children, young people and families, and provides policy advice to the German national government, the German federal states and local authorities as well as key impulses for professional practice.

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