Supplemental Material

Paracelsus 10,000: An Observational Cohort Study About the Health Status of the Population of Salzburg, Austria. Rationale, Objectives and Study Design

Vanessa Frey[a] Patrick Langthaler[a,b,c] Emanuel Raphaelis[a]
Susanne Ring-Dimitriou[d] Ludmilla Kedenko[e] Elmar Aigner[e] Jennifer Martinz[a]
Isabella Gostner[a] Arne C. Bathke[b,c,f] Paul Sungler[g] Michael Studnicka[h]
Elisabeth Haschke-Becher[i] Eugen Trinka[a,j,k]
Bernhard Iglseder[l] Bernhard Paulweber[e]

[a]Department of Neurology, Christian Doppler University Hospital, Paracelsus Medical University and Centre for Cognitive Neuroscience, Affiliated member of the European Reference Network EpiCARE, Salzburg, Austria, [b]Department of Artificial Intelligence and Human Interfaces, Paris Lodron University of Salzburg, Salzburg, Austria, [c]Team Biostatistics and Big Medical Data, IDA Lab Salzburg, Paracelsus Medical University Salzburg, Salzburg, Austria, [d]Department of Sport and Exercise Science, Paris Lodron University of Salzburg, Salzburg, Austria, [e]Department of Internal Medicine, St. Johanns University Hospital, Private Medical University of Salzburg, Salzburg, Austria, [f]Department of Statistics, University of Kentucky, Lexington, KY, USA, [g]Department of Surgery I, St. Johanns University Hospital, Paracelsus Medical University, Salzburg, Austria, [h]Department of Pulmonary Medicine, St. Johanns University Hospital, Paracelsus Medical University, Salzburg, Austria, [i]Department of Laboratory Medicine, University Hospital, Paracelsus Private Medical University, Salzburg, Austria, [j]Department of Public Health, Health Services Research and Health Technology Assessment, UMIT – University for Health Sciences, Medical Informatics and Technology, Hall in Tirol, Austria, [k]Neuroscience Institute, Christian Doppler University Hospital, Paracelsus Medical University and Centre for Cognitive Neuroscience, Salzburg, Austria, [l]Department of Geriatric Medicine, Christian Doppler University Hospital, Paracelsus Medical University, Salzburg, Austria

1.) Quality Control

Data that was transferred from handwritten to digital form was checked for correctness if the values deviated from a minimal to maximum value (table S1).

Table S1: Investigation, minimum and maximum value that was used for quality control.

Investigation	Min	Max
Height (cm)	140	220
Weight (kg)	40	180
Abdominal circumference (cm)	50	150
Blood pressure systolic (mm/Hg)	80	250
Blood pressure diastolic (mm/Hg)	40	130
Pulse pressure (mm/Hg)	25	100
Mean Arterial Pressure (mm/Hg)	40	130
Pulse (BPM)	30	120
Grip Strength (kg)	10	90
Walking Speed (s/6m)	2	6
Carotis Intima Media Thickness (mm)	0.4	1
Carotis Plaque mm^2		50
Calcium Score		100

2.) Cohort Characteristics

All reference data used was obtained from Statistik Austria [1] and originates from either the quarterly population statistics for 2014 [2][3], the Microcensus 2014 [4][5] or the Austrian Health Interview Survey (ATHIS) 2014 [6][7]. Quarterly population statistics and Microcensus data were obtained via the statistical database StatCube [8]. For the ATHIS data we requested the original dataset. If not otherwise indicated, we merged data of the nine Austrian provinces to the Austrian population and accumulated all age groups to one group of 40- 69 years. In our study data set, we included only data of participants who were 40 to 69 years of age. Classification into different degrees of urbanization was conducted via the degree of urbanization (DEGURBA) criteria by Eurostat [9].

Regarding the ATHIS, we adopted the weights provided in the dataset to extrapolate to the Salzburgian and Austrian populations respectively. Microcensus data are already extrapolated and while this makes weighting unnecessary, we did not know the exact size of the relevant subgroups of the original sample. As an approximation, we multiplied the extrapolated values with 0.006, since the Microcensus included about 0.6% of the whole population as sample. This might slightly under or overestimate the sample size and thereby the width of the confidence interval, but we consider it a sufficient approximation for the purpose of the work presented here.

For categorical variables, confidence intervals in the figures are 95% Agresti-Coull confidence intervals for a binomial proportion. For continuous variables (only *mean minutes of exercise per week*) they are calculated as the mean +- 1.96 times the standard error.

For all statistical calculations and creation of figures the statistical software R™ (Version 4.0.2) [10] was used, in particular the package *tidyverse* [11].

2.1 Age

We compared the ratio of women and man within the 40 to 69 years age group of our cohort with the Austrian population and the population of the province of Salzburg. Quarterly population statistics were used for comparison.

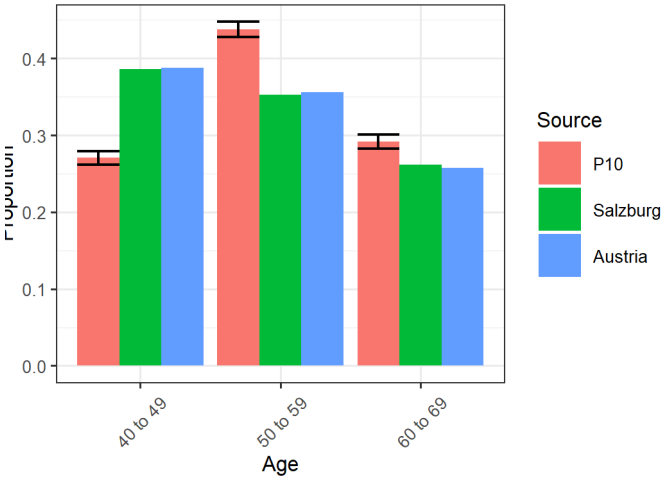

Figure S1: Age distribution from 40 to 69 years of the Paracelsus 10,000 cohort (P10), Salzburg population and Austrian population.

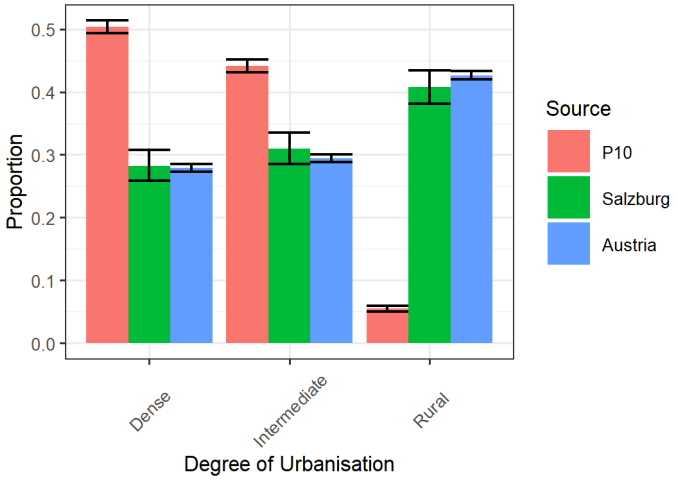

Figure S2: Distribution of the Paracelsus 10,000 cohort (P10), Salzburg population and Austrian population regarding degree of urbanization.

2.2 Degree of Urbanisation

Reference data was taken from the Microcensus while we chose the DEGURBA criteria of Eurostat to classify settlement density.

We found the following distribution of urbanization degrees in the age groups; Age group 40-49: dense 37.2%, intermediate 57.1% and rural 5.7%. Age group 50-59: dense 54.1%, intermediate 40.6% and rural 5.33%. Age group 60-69: dense 56.9%, intermediate 37.5% and rural 5.6% (fig.S.2).

2.3 Migratory Background

We used reference data from the Microcensus while the definitions of migratory background were set according to the United Nations Economics Commission for Europe (UNECE) [12].

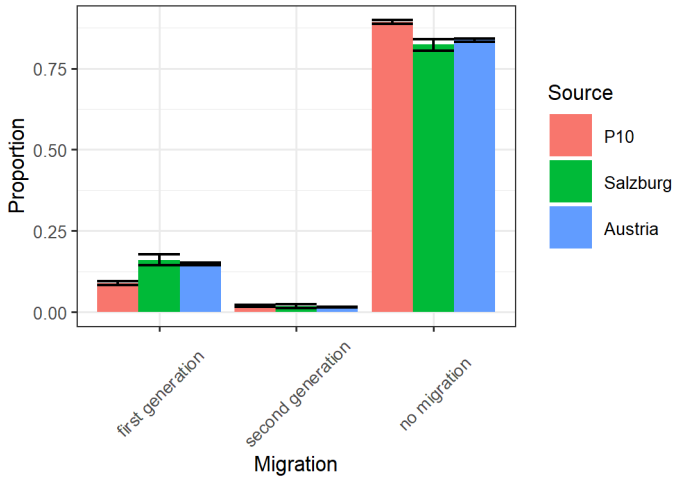

Figure S3: Migration background of the Paracelsus 10,000 cohort (P10), Salzburg population and Austrian population.

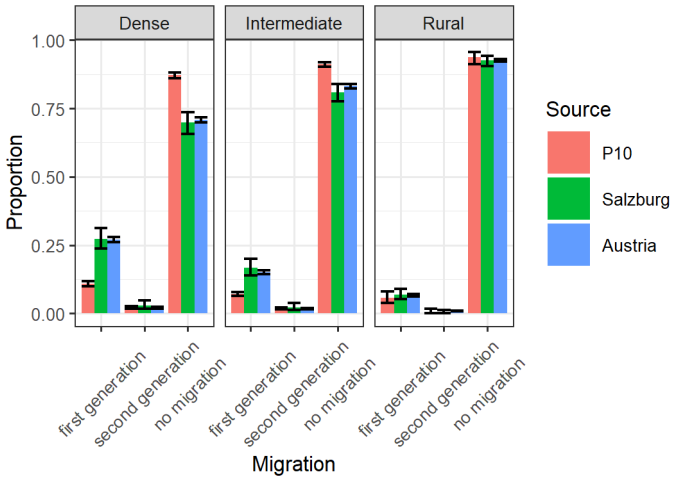

Figure S4: Distribution of the Paracelsus 10,000 cohort (P10), Salzburg population and Austrian population regarding migration background and degree of urbanization.

2.4 Attained Education

We used reference data from the Microcensus and the International Standard Classification of Education (ISCED) [13]. Criteria were chosen as metric for degree of education to which the Austrian education attainments were adjusted (Table S2).

Table S2. Assignment of possible answers in the P10 questionnaire to ISCED Level.

P10 Categories	**ISCED Level**
No finished education, compulsory education	ISCED 0-2
Apprenticeship, master of a trade, secondary school with- and without qualification for university entrance	ISCED 3-5
University, technical college	ISCED 6-8

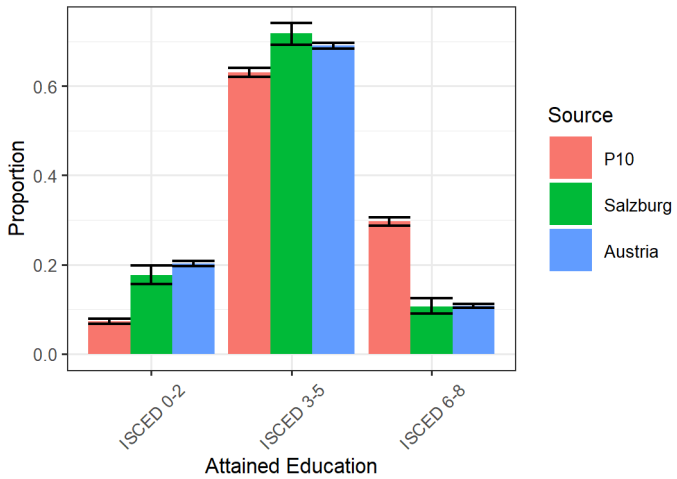

Figure S5: Distribution of education in the Paracelsus 10,000 cohort (P10), the Salzburg population and the Austrian population. ISCED= International Standard Classification of Education.

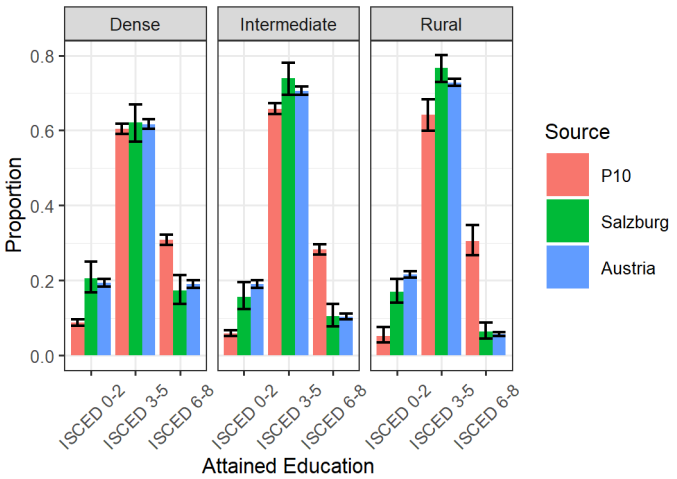

Figure S6: Distribution of education in the Paracelsus 10,000 cohort (P10), the Salzburg population and the Austrian population. ISCED= International Standard Classification of Education. Data is split up in urbanization degrees.

2.5 Type of Employment

We used reference data from the Microcensus while only the displayed types of employment were included. Family workers, unemployed and retired participants were excluded from the reference data to provide a valid comparison. The P10 cohort however was asked for the type of employment of the last engagement, including unemployed or retired participants.

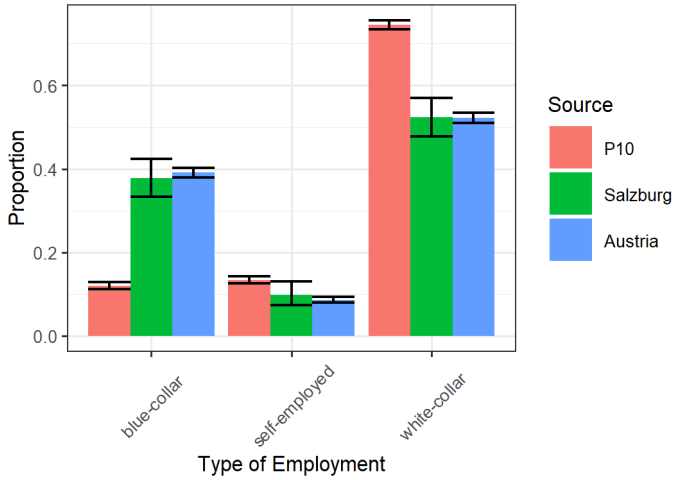

Figure S7: Distribution of employment in the Paracelsus 10,000 cohort (P10), the Salzburg population and the Austrian population.

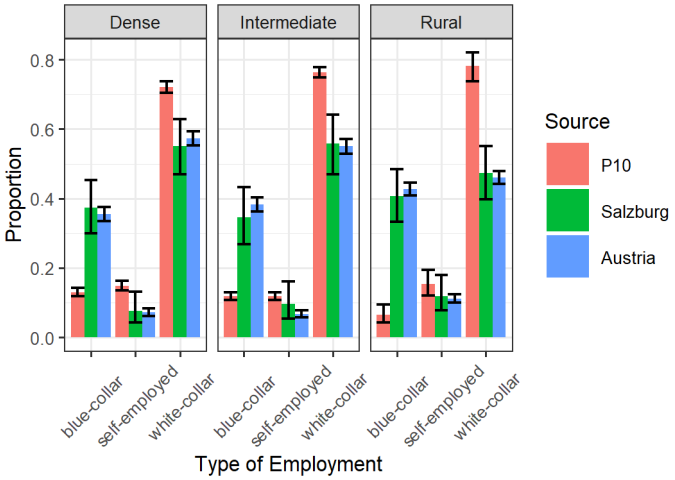

Figure S8: Distribution of employment in the Paracelsus 10,000 cohort (P10), the Salzburg population and the Austrian population split up in different urbanization degrees.

2.6 Smoking

Reference data was taken from the ATHIS, while we considered people as smokers if they reported current cigarette use, irrespective of the amount and regularity. Ex- Smokers are people who used to smoke cigarettes on a regular basis in the past but do not currently smoke at all. Never smokers are people who never regularly smoked cigarettes.

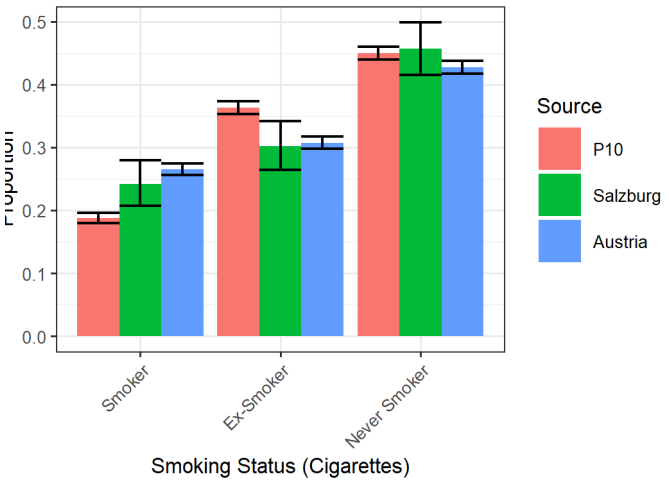

Figure S.9: Smoking habits in the Paracelsus 10,000 cohort (P10) and the Austrian population.

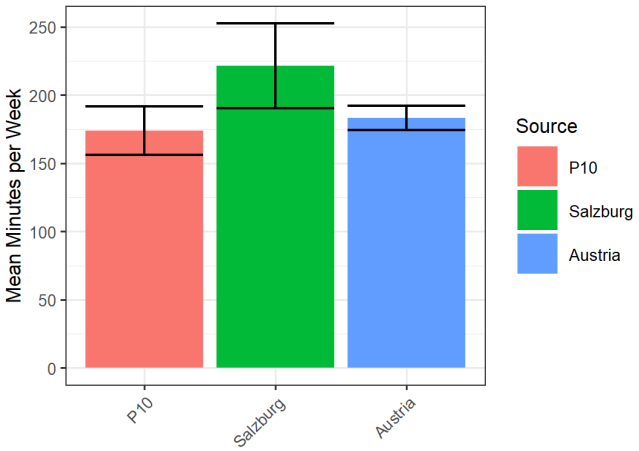

Figure S.10: Moderate and intense exercise in the Paracelsus 10,000 cohort (P10) and the Austrian population.

2.7 Physical Activity

We compared the average minutes per week of moderate to vigorous exercise not related to transportation or work of our cohort and the Austrian population. Reference data was obtained from the ATHIS dataset containing the total number of minutes spent exercising in ones' free time during a typical week. The data of the P10 cohort was extracted from two questions of the IPAQ, one on moderate and one on vigorous physical activity. We multiplied the number of days with hours/minutes per day spent with moderate or vigorous physical activity in ones' free time in the last 7 days. Data of moderate and vigorous activity were then added up. For this analysis our sample size was smaller and age range was limited to 50-59 years, since only subjects participating in the extended program answered the IPAQ.

2.8 Data on health parameters in the cohort and the sub-cohort

Table S3 displays the distribution of anthropometric data, lipid metabolism, glucose metabolism, kidney function and blood pressure in the study cohort, split up into women and men. The 5^{th} and 95^{th} percentile, first and third quartile and median and mean, as well as the standard deviation of data are shown for each parameter.

Table S3: Data on anthropometry, lipid and glucose metabolism, kidney function and blood pressure of the cohort in total, in women as well as in men.

				Percentiles of the distribution					Average	
		Sex	N	5th Perc.	First Quartile	Median	Third Quartile	95th Perc.	Mean	SD
	Age (years)	Total	9721	43	50	55	61	68	55	7
		Women	5019	43	49	54	61	68	55	7
		Men	4702	43	50	55	61	68	56	8
Anthropometric Data	Abdominal Circumference (cm)	Total	9687	73	84	93	101	116	93	13
		Women	5005	71	79	87	96	111	88	13
		Men	4682	81	91	98	105	119	99	11
	BMI (kg/m^2)	Total	9710	20	23	26	29	35	26	5
		Women	5015	19	22	25	28	35	26	5
		Men	4695	22	24	27	29	35	27	4
Lipid Metabolism	Total Cholesterol (mg/dL)	Total	9643	150	184	209	234	276	211	39
		Women	4977	156	188	212	238	280	214	38
		Men	4666	145	180	206	231	271	207	39
	LDL-Cholesterol (mg/dL)	Total	9602	84	116	140	165	204	141	37
		Women	4962	85	114	138	163	204	140	36
		Men	4640	84	118	142	167	204	143	37
	HDL-Cholesterol (mg/dL)	Total	9604	38	50	61	74	96	63	18
		Women	4963	45	58	69	82	102	71	18
		Men	4641	35	45	54	64	82	55	15
	Triglycerides (mg/dL)	Total	9644	49	71	97	137	241	116	81
		Women	4977	47	66	87	120	197	101	62
		Men	4667	54	80	110	157	285	133	95
	Lipoprotein(a) (mg/dL)	Total	8337	3	8	17	58	210	50	72
		Women	4361	3	9	18	61	213	52	73
		Men	3976	3	8	17	54	207	49	70
	Apolipoprotein B (mg/dL)	Total	9643	70	90	106	124	153	108	25
		Women	4977	69	88	103	120	149	105	25
		Men	4666	72	93	110	128	156	111	26
Glucose Metabolism	HbA1c (%)	Total	9298	5	5.3	5.4	5.6	6.1	5.5	0.5
		Women	4767	5	5.2	5.4	5.6	6	5.5	0.4
		Men	4531	5	5.3	5.4	5.7	6.4	5.5	0.6
	Glucose (mg/dL)	Total	9646	79	87	93	100	120	96	17
		Women	4977	78	85	90	97	112	92	14
		Men	4669	82	90	96	103	128	99	19
	Insulin (mIU/L)	Total	8960	3.4	5.5	7.9	11.7	22.8	9.9	8
		Women	4656	3.3	5.2	7.2	10.4	19.4	8.9	7.2
		Men	4304	3.6	6.1	8.8	13.3	25.5	11.1	8.6
	HOMA-IR	Total	8955	0.73	1.23	1.83	2.84	6.26	2.48	2.61
		Women	4655	0.68	1.11	1.63	2.42	4.99	2.13	2.43
		Men	4300	0.81	1.4	2.09	3.36	7.38	2.86	2.75
Kidney Function	Creatinine (mg/dL)	Total	9649	0.62	0.74	0.85	0.96	1.13	0.86	0.18
		Women	4978	0.59	0.68	0.76	0.83	0.96	0.76	0.12
		Men	4671	0.74	0.86	0.94	1.04	1.19	0.96	0.18
	eGFR (mL/min/1.73m^2)	Total	9629	61	72	81	91	109	83	16
		Women	4971	60	71	80	90	107	81	15
		Men	4658	63	74	83	92	109	84	16
Blood Pressure	Systolic (mmHg)	Total	9691	105	118	127	139	161	129	17
		Women	5004	103	113	124	136	159	126	17
		Men	4687	111	122	131	141	162	133	16
	Diastolic (mmHg)	Total	9692	66	75	81	88	99	82	10
		Women	5004	65	72	78	85	96	79	10
		Men	4688	71	79	85	91	101	85	9

Perc.: Percentile, SD: Standard Deviation, BMI: Body Mass Index, LDL: Low-density Lipid, HDL: High-density Lipid, HbA1c: Hemoglobin A1c, HOMA-IR: Homeostasis Model Assessment for Insulin Resistance, eGFR: epidermal Growth Factor Receptor.

Literature supplementary material:

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