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Article

Education, Health, and Social System. European Mountain Series Analysis (1)

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Abstract: The article is part of a series dedicated to mountain science, focusing on the statistical analysis of the sectors presented in Eurostat in the Business Demography Statistics—mountain area section. This paper refers to the education, health and social work sectors. The analysis is carried out for all indicators presented in the Eurostat metaindex, explanations posted by the authors at <https://doi.org/10.5281/zenodo.14713867>. The article presents a series of analyses based on statistics for the years 2021–2022. The results show a revival of the analyzed sectors, especially for indicators relevant for the development of mountain entrepreneurship. European analyzed countries are representative for mountain area, namely Bulgaria, Czechia, Germany, Greece, Spain, France, Croatia, Italy, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Sweden.

Keywords: education; health; mountain science; social work

Introduction

In their study on mountain medicine education, Peters and Plots (1998) examine the development of educational programs in European mountain medicine. The authors argue that mountain medicine education places significant emphasis on sub-specialized programs. Documentation from the International Union of Mountaineering Associations (UIAA) and various publications highlight the extensive range of such specialized educational directions, which are implemented in European countries with established traditions in mountain medical education, including France, Italy, Spain, the United Kingdom, Switzerland, Austria, Germany, and the Netherlands. The study concludes that education in mountain medicine could be further enhanced through the integration of related sub-specializations, such as expedition medicine, alpine medicine, and rescue medicine. (Peters & Plötz, 1998)

At a global level, mountain education fosters the development of numerous high-altitude areas. An inventory of education programs in mountainous regions identifies 28 initiatives conducted by various entities. The majority of these programs are based in Europe and North America, with a smaller number operating in Central and East Asia and Australia. These programs take various forms, including traditional university courses, summer schools, distance learning, NGO-led schools, and scientific academies. Most of these initiatives fall under the categories of non-formal or informal education. Many courses aim to create or strengthen policies and institutional networks, particularly in the context of mountain regions. The study highlights the importance of designing and redesigning mountain-specific curricula and developing communication and implementation methods tailored to the rural characteristics of high-altitude areas. It is worth noting that in recent years, the interdisciplinarity associated with mountain education has expanded significantly. Many mountain courses are oriented towards developing linguistic and digital skills, enhancing the local areas where these mountain schools are conducted. These activities have proven effective in leveraging the potential of such regions. In recent years, distance learning has become a critical component of

mountain education programs. The establishment of educational networks aimed at lifelong learning to enhance the resilience of mountain communities is an essential outcome. Initiatives such as the Mountain Research Initiative, the Himalayan University Consortium, and the Network for European Mountain Research ensure the emergence and sustainability of such efforts. In mountainous areas, programs focused on education related to high-altitude zones provide valuable feedback on transferable knowledge and skills, as well as the local and regional mountain context. The transformation of mountain societies is an undeniable and ongoing phenomenon, making mountain education a current priority for the global community. (Ueno et al., 2020)

Montology, the transdisciplinary science of mountains, related to its educational dimension, encompasses numerous pedagogical dimensions which can be used to metamorphose the dynamics of the duo sustainable development—regenerative development, by using multidimensional perspectives. A study on the application of different learning methodologies to the spectrum of mountain education, focuses on integrative and holistic mountain landscapes as items related to some scholastic and non-scholastic education. The study presented shows that there are different impacts related to the subjects addressed, but also related to the environment of origin of the learning subjects, the multidimensionality of mountain learning pedagogy being an imperative. The authors propose a regenerative development, superior to the sustainable one, in view of the convergence of the mountain educational act: learning-teaching requiring a dynamic approach. (Sarmiento et al., 2020)

The presented literature shows the importance of the educational sectors for the mountain area, as well as those of medicine and social work. The presented analyses aim to support the importance of these sectors for the development of mountain areas.

Methods and Data

Frequency statistical analysis was conducted using Excel and SPSS. Missing data were addressed by imputing the most appropriate values to ensure continuity and reliability of the analysis.

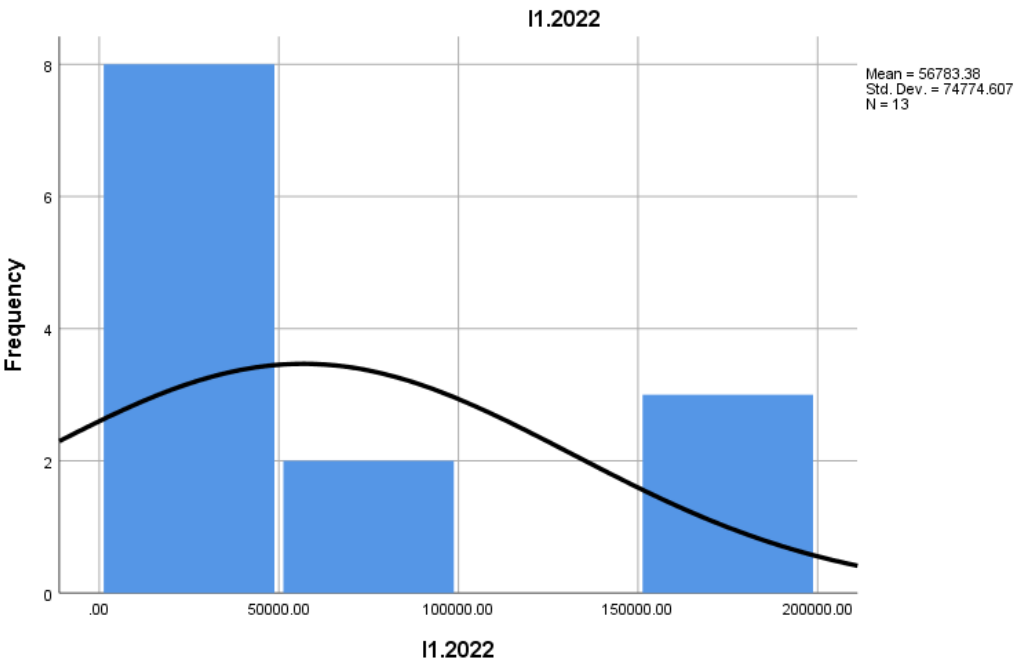
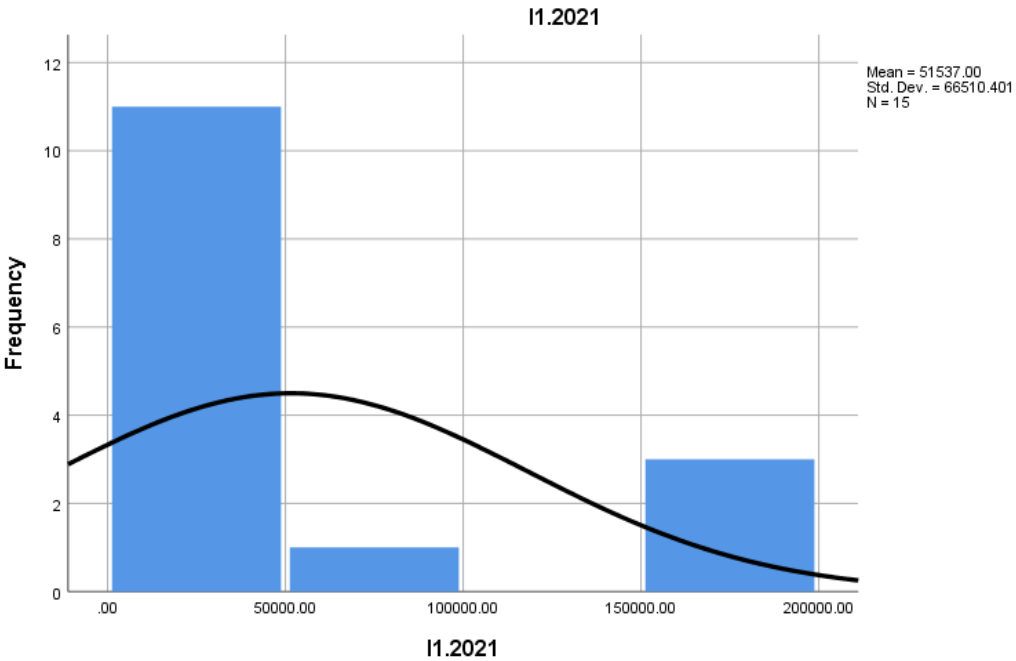
Data on the number of existing enterprises and newly established enterprises are presented for the years 2021 and 2022.

The data are organized in the following sequence for all variables analyzed: I1.2021, I1.2022, I2.2021, I2.2022:

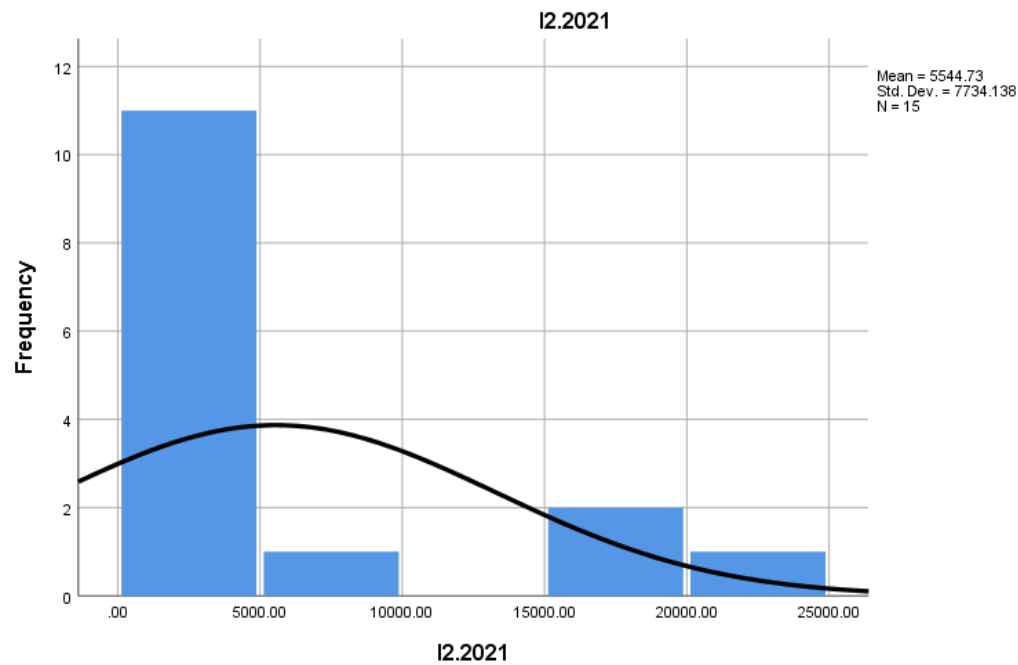
- Number of variables, Valid: 15, 13, 15, 11 and Missing: 1, 3, 1, 5;
- Mean: 51537.0000, 56783.3846, 5544.7333, 4546.8182;
- Std. Error of Mean: 17172.91162, 20738.74465, 1996.94577, 2190.09488;
- Median: 16022.0000, 15239.0000, 1992.0000, 1541.0000;
- Mode: 1020.00a, 864.00a, 71.00a, 78.00a;
- Std. Deviation: 66510.40072, 74774.60723, 7734.13771, 7263.72298;
- Variance: 4423633404.000, 5591241886.423, 59816886.067, 52761671.564;
- Skewness: 1.466, 1.302, 1.584, 1.866;
- Std. Error of Skewness: .580, .616, .580, .661;
- Kurtosis: .512, -.132, 1.008, 1.979;
- Std. Error of Kurtosis: 1.121, 1.191, 1.121, 1.279;
- Range: 181325.00, 190044.00, 23020.00, 19971.00;
- Minimum: 1020.00, 864.00, 71.00, 78.00;
- Maximum: 182345.00, 190908.00, 23091.00, 20049.00;
- Sum: 773055.00, 738184.00, 83171.00, 50015.00;
- Percentiles, 25: 10625.0000, 11211.5000, 662.0000, 766.0000;
- 50: 16022.0000, 15239.0000, 1992.0000, 1541.0000;
- 75: 53026.0000, 115192.5000, 6459.0000, 3168.0000.

Results and Discussion

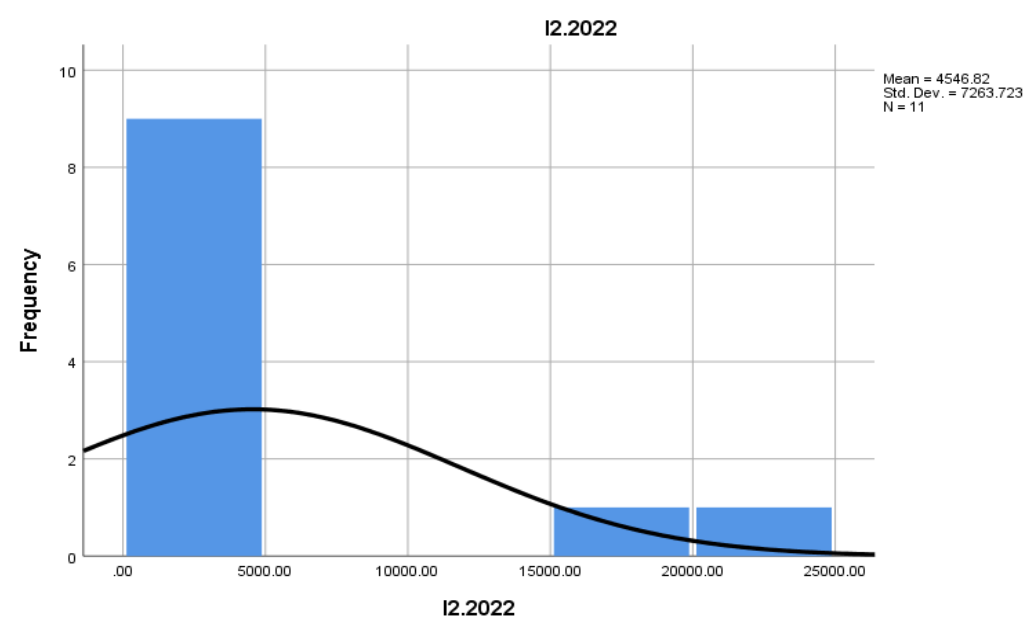
The histograms presented indicate a high frequency in 2021, with unit values exceeding 4, followed by a decrease in 2022, with unit values falling below 4. The leftward orientation of the asymptotes reflects a clustering of data around the first countries analyzed. Italy’s central position in the database of studied countries was deliberately chosen to create a distribution curve that closely represents reality and to establish a median reference point in the frequency analysis. As the country with the largest population engaged in mountain-related enterprises (I1.2021 and I1.2022), Italy and Spain play a dominant role in shaping the spectrum of educational, medical, and social work development in Europe.



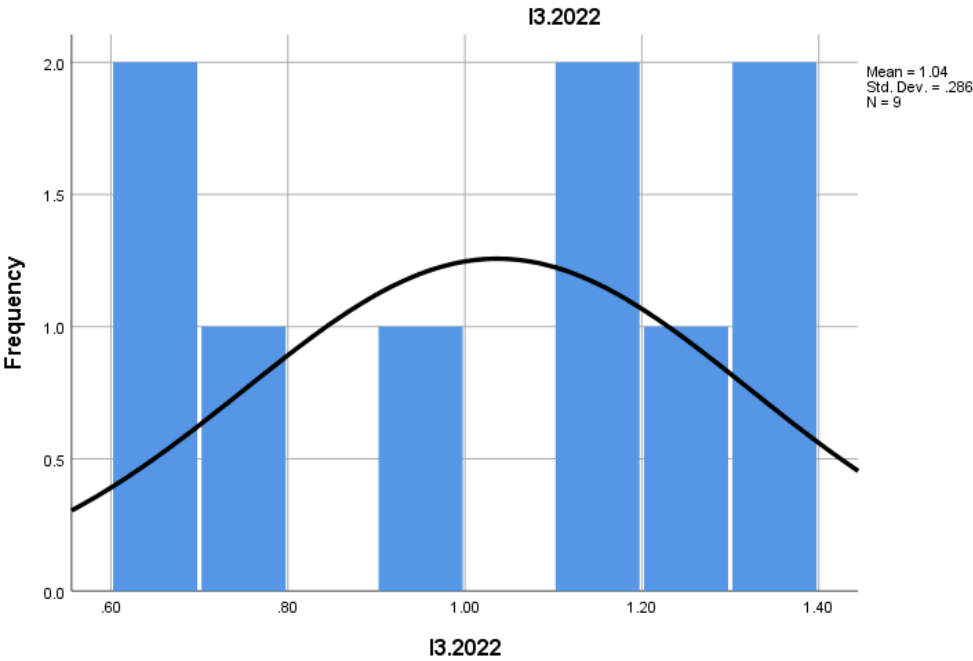
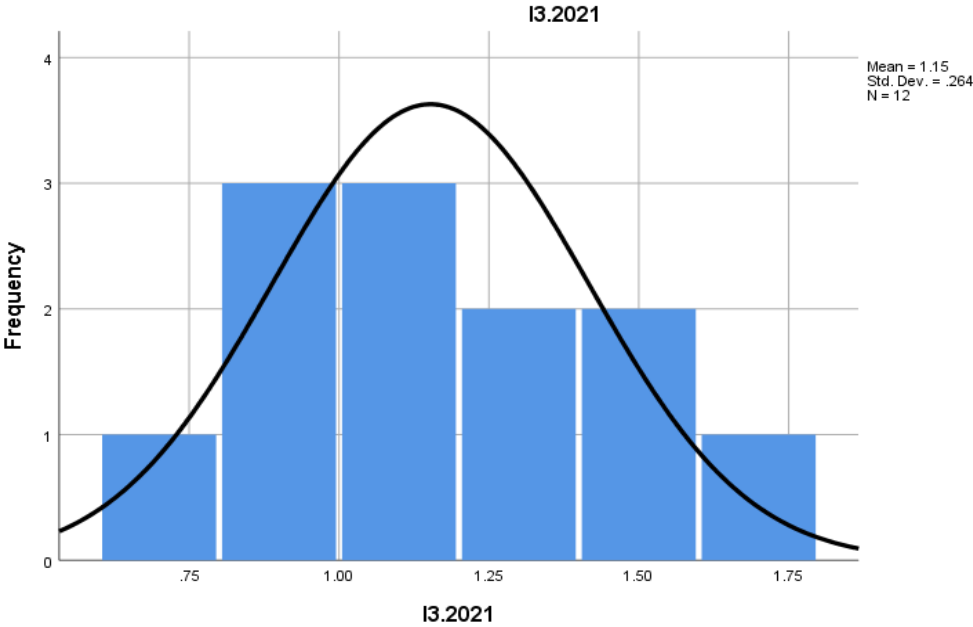
Regarding the dynamics of new business start-ups in the European countries analyzed, a reduction in new business start-ups is observed in 2022 compared to 2021. This phenomenon is considered worrying, especially given the move of many educational and social work activities in mountain areas online.



Policies aimed at supporting the establishment of new enterprises in education, health and social work in mountain areas must be undertaken as urgently as possible by European countries (I2.2021 and I2.2022).



An important indicator of the “health status of mountain affairs”, employability in education, health and social work shows a high degree of support in 2021, unlike 2022 when the frequency decreased even in traditional European mountain countries (I3.2021 and I3.2022).



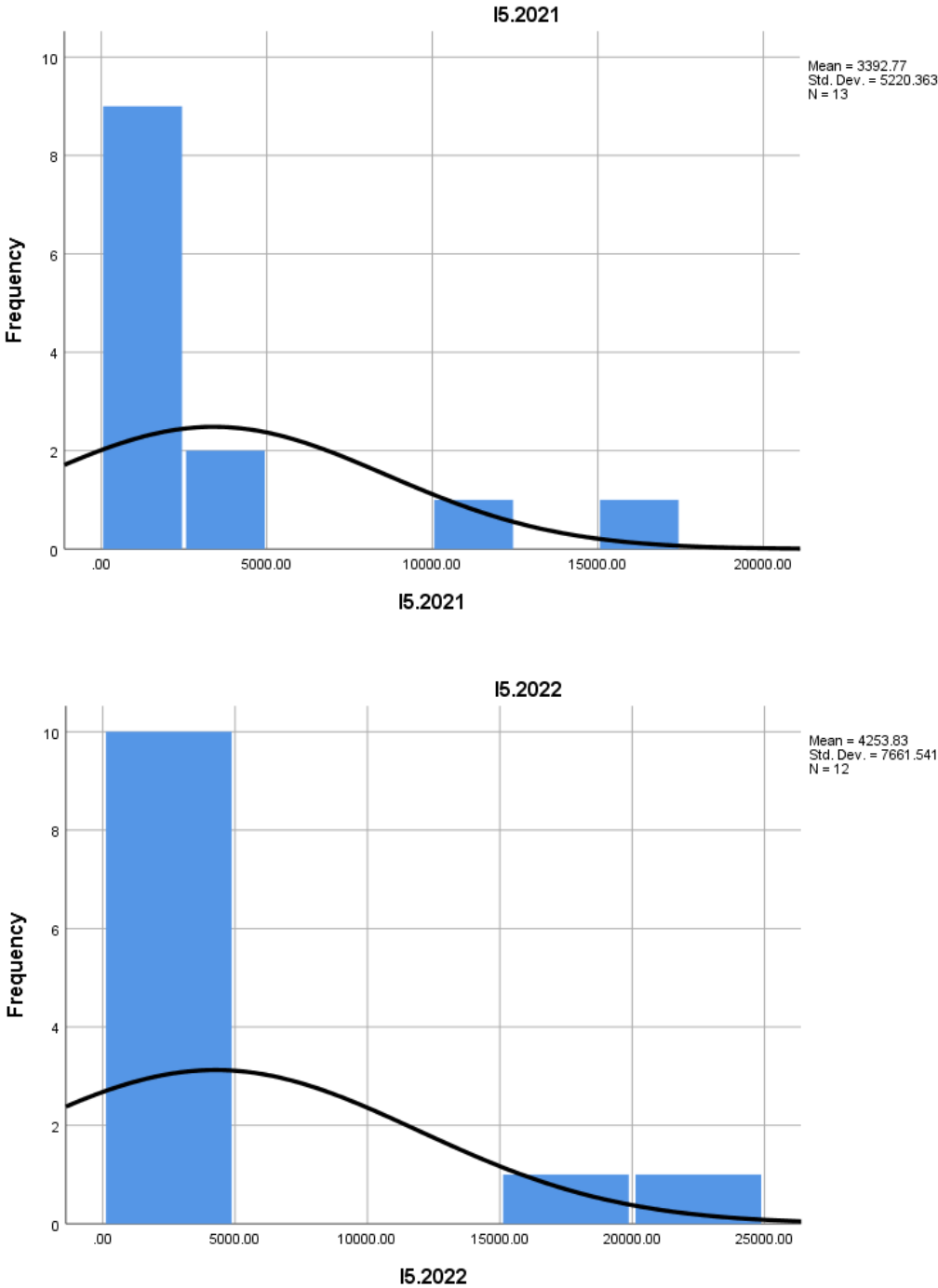
The Gaussian shape of both asymptotes of the I3 indicator shows an almost perfect balance in the employment rate in the European mountain area. The unimodal distribution shows the importance of the employment patterns of pivotal countries such as France and Italy in increasing the employability rate of European entrepreneurship.

One of the most important indicators of business demography statistics—education, health and social work sectors—in the European mountain area is the closure of related enterprises (I5.2021 and I5.2022).

Contrary to expectations, due to the shift of activities from physical to online, the closure of enterprises continues to negatively surprise European mountain entrepreneurship. From the analysis

of histograms and Eurostat databases, it can be seen that all countries have a degree of reduction in the number of businesses in the mountain area, except for Romania and Slovenia.

The phenomenon of closure is gaining momentum in 2022, unlike 2021 when the frequency was much lower. Previous analyses by the authors, for the period 2008-2018, show a constant and normally linear increase for the previous years. The frequency presented in 2022 leads to the idea that, if the trend continues, the following years will be decisive—in a negative sense—for these European mountain sectors.



The detailed analysis of all indicators for the studied mountain sectors shows significant fluctuations in some countries during the period 2021-2022 (Table 1), as follows:

- Bulgaria has high shares in the degree of closure of enterprises (I5), including the degree of unemployment in the mountain area (I19);
- Czechia has very well developed the correlation between the growth of mountain businesses and employability (I10);
- Spain stands out for its increase in employed people (I16 and I25);
- France, a leader, in a positive sense, in many indicators has problems with the decrease in employment in the mountain area (I19 and I22);
- Croatia has a relatively redundant situation in terms of employability, but ultimately the employment rate has increasing shares (I10);
- Italy, the leader in the ranking of European mountain businesses, is developing a rural-mountain model worth following, especially in terms of increasing employability and attracting new business people to high areas (I10);
- Austria, the emerging leader of European mountain businesses, strongly supports mountain entrepreneurship, especially by increasing the employment rate (I10);
- although it survives well the new realities of the information society that partially affect the national mountain environment, Poland has the same problems encountered in many European countries, namely the increase in the unemployment rate (I27);
- Romania and Slovenia, emerging countries in the group of European mountain countries, present promising statistics for high areas, the most important aspect in the return of migrants' home being the significant increase in the employment rate in the mountain area (I10);
- at European level, Slovakia presents the highest level of enterprises, being the leader in the growth of existing businesses in the analyzed period (I1);
- Sweden is a European mountain model in terms of the increase in employability in businesses that have lasted at least 3 years since their establishment (I24).

Table 1. Business Demography Statistics—European Mountain Area (± 2021/2022, %).

	I1	I2	I3	I5	I6	I7	I8	I10	I12	I13	I14	I16
Bulgaria	3.59	6.00	-31.60	144.41	0.00	6.92	3.35	-4.93	59.87	2.33	135.82	-0.49
Czechia	1.37	5.87	7.95	4.85	18.12	-19.07	-20.14	98.24	4.04	4.35	3.33	-0.31
Germany	0.00	0.00		0.00		-100.00	-100.00	0.00	-100.00	-100.00	-100.00	-100.00
Greece		0.00	0.00									
Spain	-1.61											2.30
France	7.04	-2.82	-18.31	8.06	0.00	9.31	2.16	0.00	-5.42	-9.19	0.96	4.38
Croatia	4.01	2.99	4.29	55.43	-52.40	40.76	35.48	89.71	17.00	-1.04	49.48	1.03
Italy	-0.06	0.10	-0.63	1.40	-5.97	3.65	3.48	107.92	0.78	0.00	1.48	0.94
Austria	1.73	8.08		19.50		-9.83	-11.30	93.15	11.03	6.13	17.60	
Poland	-1.69	-5.81	32.03	18.46	-23.35	-0.41	1.39	83.55	9.07	-4.14	20.42	-1.36
Portugal	0.00	0.00	0.00	0.00	0.00	-100.00	-100.00	0.00	-100.00	-100.00	-100.00	
Romania	0.56	3.50	-22.13	-13.68	-10.82	2.41	1.88	81.74	-5.03	3.02	-14.12	16.97
Slovenia	2.41	7.10	-0.85	-9.04	7.57	-2.12	-4.53	98.47	-1.93	4.61	-11.24	2.18
Slovakia	5.56	20.52	19.64	39.69	0.95	-1.62	-6.77	102.48	22.32	14.19	32.30	-0.14
Sweden	-16.98	-8.93	-39.25	26.67	-71.47	0.00	20.56	100.00	24.66	9.73	52.96	-0.32
	I17	I18	I19	I20	I21	I22	I23	I24	I25	I26	I27	I28
Bulgaria	-27.33	-27.50	120.16	0.00	25.94	120.93	0.00	0.00	-0.72	-39.88	0.00	-17.26
Czechia	14.12	14.94	7.78	-6.76	-5.22	7.58	-6.42	-4.55	-0.75	-100.00	0.00	0.00
Germany				0.00	-100.00		0.00	0.00	-100.00			
Greece	-100.00											
Spain									2.63			
France	-20.66	-24.22	64.66	0.00	-13.03	59.18	0.00	0.00				
Croatia	7.63	6.94	130.75	-30.12	-6.10	127.03	-30.77	-46.02	0.90	8.26	252.11	0.58
Italy	-0.54	-1.52	29.14	-0.91	4.16	27.85	-2.42	-9.24	1.37	3.66	29.50	4.21

Austria												
Poland	24.29	25.66	57.10	-22.64	-14.77	58.91	-21.84	-25.31	-1.26	65.95	118.51	33.51
Portugal	-100.00		-100.00	0.00	-100.00			0.00		-100.00	-100.00	0.00
Romania	-19.22	-30.97	-68.39	-11.71	-9.71	-72.94	-24.50	-7.82	17.85	-19.67	-82.49	-0.55
Slovenia	6.21	3.03	-100.00	8.84	5.44	-100.00	5.71	8.35	2.17	4.32	0.00	-1.79
Slovakia	44.00	44.31	20.50	-0.69	-4.33	20.86	-0.51	24.63	-1.09	-100.00	-34.72	0.00
Sweden	-45.00	-45.10	0.00	-71.43	-72.26	1.69	-71.43	140.18	1.97	-79.17	40.00	-62.13

Source: Eurostat.

This paper has been revised with the assistance of artificial intelligence.

Conclusion

The article highlights the dynamic changes in education, health, and social work sectors in European mountain areas during 2021–2022, based on Eurostat Business Demography Statistics. The analysis reveals notable fluctuations, including a decline in new business startups and enterprise closures, some countries playing pivotal roles in shaping sectoral trends. Employment rates show mixed outcomes, with promising growth in most countries, especially in emerging countries, while established mountain regions face challenges. The study underscores the urgency of targeted policies to support entrepreneurship and employment, ensuring the sustainable development of mountain communities.

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