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Educational Report

POPULATION, LIVE BIRTHS, LIVE BIRTH
RATE AND FALL PUBLIC SCHOOL
ENROLLMENT IN
SAGUACHE COUNTY
COLORADO 1960-1979

Dr. Marc Swadener
School of Education
University of Colorado
Boulder, Colorado

Center for Educational
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POPULATION, LIVE BIRTHS, LIVE BIRTH
RATE AND FALL PUBLIC SCHOOL
ENROLLMENT IN
SAGUACHE COUNTY
COLORADO 1960-1979

Dr. Marc Swadener
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Population, Live Births, Live Birth Rate,
and Fall Public School Enrollments for
SAGUACHI COUNTY
Colorado 1960-1979

This volume contains data on population, live births, live birth rate, Fall grade level and total public school enrollments for the Colorado county named above for each of the years 1960 through 1979 (with the exception of grade level enrollments for the year 1960). These data were collected from various sources listed at the back of this volume and are presented here in one volume to save others many hours of data collection efforts. These data were collected and compiled as part of a study to project public school enrollments in Colorado and Colorado counties which was conducted over the period December 1978 through December 1980. As a result of that study several volumes of reports were published.

1. PROJECTED COLORADO PUBLIC SCHOOL ENROLLMENTS TO THE YEAR 2000, Regents of the University of Colorado, Boulder, Colorado, 15 pp.
2. PROJECTED COLORADO PUBLIC SCHOOL ENROLLMENTS TO THE YEAR 2000- TECHNICAL REPORT. Regents of the University of Colorado, Center for Educational Leadership Services, School of Education, University of Colorado, Boulder, Colorado, 56 pp.
3. POPULATION, LIVE BIRTHS, LIVE BIRTH RATE, AND FALL PUBLIC SCHOOL ENROLLMENTS FOR COLORADO COUNTIES 1960 - 1979, one volume for each county and one combined volume.
4. PROJECTED PUBLIC SCHOOL ENROLLMENTS IN COLORADO COUNTIES TO THE YEAR 2000, Center for Educational Leadership Services, School of Education, University of Colorado, Boulder, Colorado, one volume for each county and one combined volume.

The school enrollment projection project was initiated at the request of the Regents of the University of Colorado and was completed in order to provide data for educational planning for agencies in Colorado.

Table 1 includes population by census for the years 1960 and 1970, population estimates for each of the years 1961-1969 and 1971-1979, actual count live births, live birth rate per one thousand population computed from population and live births, and Fall total school enrollment. In addition there is given a computed percent change from year to year for each of these four sets of data. Lastly Table 1 includes the mean percent change from year to year for the 1961-1979 period. The data on percent change from year to year and the mean percent change for the period allow the reader to identify growth and decline patterns quickly. By comparing two or more of the percent change columns either by sight or by more sophisticated methods, one can determine relationships between the changes in the data from year to year. Thus one can obtain potentially useful information for planning for the future.

Table 2 present Fall grade level enrollment data for each of the years 1961-1979. Mean enrollments by grade are also given. The grade category "other" includes enrollment in non-graded classes, special education, pre-school, etc.

Table 3 presents Fall grade level enrollments as a percent of total school enrollment. Means by grade level are also given.

Table 4 presents the multipliers needed to obtain enrollment in one grade from enrollment in the next lower grade within the same year. These were computed by dividing enrollment in a grade by enrollment in

the next lower grade within the same year. Means for each level are also presented.

Table 5 presents what is commonly termed "cohort survival multipliers." Cohort survival multipliers are in actuality factors which allow one to compute enrollment in one grade one year from enrollment in the previous grade the previous year. In effect these factors allow one to "follow" an age group from one year to the next. These multipliers were computed from the entries in Table 2 by dividing enrollment in one grade one year by the enrollment in the previous grade the previous year. Means at each level are also given. In addition, the product of the means is given. This product, in a sense, gives one an estimate of how many students might be estimated to enter grade twelve from the number of students entering kindergarten twelve years previous. Thus, in a sense, the product of the means in Table 5 is a measure of the "survival rate" for a schools program.

The means given in Table 5 are useful in estimating grade enrollments for the future (in the neighborhood of 5-6 years) from known enrollments using the procedure given below. This method of projection is called "cohort survival projection," thus the entries at the bottom of Table 5 could prove useful for local officials.

Stepwise instructions for using the cohort survival multipliers for
estimating grade level enrollments in the future

As was indicated above the mean entries at the bottom of Table 5 can be used to project grade level enrollment from known enrollment at present. Suppose one wished to project grade seven enrollment for five years.

1. Construct a matrix with years given along the left and grade levels across the top. Years should begin with the year of last known enrollments and grade levels should begin with kindergarten and progress through the desired grade level.

Grade Levels

	Grade Levels							
	K	1	2	3	4	5	6	7
Year	1979							
	1980							
	1981							
	1982							
	1983							
	1984							

2. Enter the known enrollments for the first year (hypothetical case)

	K	1	2	3	4	5	6	7
1979	550	625	640	680	672	676	661	660
1980								
1981								
1982								
1983								
1984								

3. At the top of the matrix between the grade levels enter the mean multipliers from the bottom of Table 5. (Those given in this example are for the State of Colorado.)

		1.146	.984	1.002	1.007	1.008	1.001	1.038
	K	1	2	3	4	5	6	7
1979	550	625	640	680	672	676	661	660
1980								
1981								
1982								
1983								
1984								

4. Multiply enrollment in a grade by the multiplier at the top right of that grade column to obtain estimated enrollment in the next grade the next year.

		1.146	.984	1.002	1.007
	K	1	2	3	
1979	550	625	640	680	
1980		X			
1981			Y		
1982				Z	

Thus to get the entry in the box marked X multiply 550 by 1.146 to obtain 630. The box marked Y would be $630 \times .984 = 620$. Z would be $620 \times 1.002 = 621$.

5. Continue this process until the table is completed downward along the diagonal lines.

		1.146	.984	1.002	1.007	1.008	1.011	1.038
	K	1	2	3	4	5	6	7
1979	550	625	640	680	672	676	661	660
1980		630	615	641	685	677	683	686
1981			620	616	645	690	684	708
1982				621	620	650	698	710
1983					625	625	657	725
1984						630	632	682

Thus one estimate for grade seven enrollment in 1984 for this county (hypothetical) is 682. The word estimate here is underscored and should be constantly kept in mind. This method of projection yields only grade level estimates and is not sensitive to all factors involved in enrollments. The tables for the county named above follow:

55 SAGUACHE COUNTY, COLORADO

TABLE 55-1. POPULATION, LIVE BIRTHS, LIVE BIRTH RATE AND TOTAL SCHOOL ENROLLMENT FOR THE YEARS 1960 THROUGH 1979 ALONG WITH THE PERCENT CHANGE IN EACH FROM THE PREVIOUS YEAR.

YEAR	POPULATION	PERCENT CHANGE	LIVE BIRTHS	PERCENT CHANGE	LIVE BIRTH RATE	PERCENT CHANGE	SCHOOL ENROLLMENT	PERCENT CHANGE	YEAR
1960	4473.		131.		29.3		1241.		1960
1961	4540.	1.498	156.	19.084	34.4	17.327	1240.	-.081	1961
1962	4530.	-.220	137.	-12.179	30.2	-11.986	1250.	.806	1962
1963	4620.	1.907	118.	-13.869	25.5	-15.546	1335.	6.800	1963
1964	4520.	-2.165	105.	-11.017	23.2	-9.048	1333.	-.150	1964
1965	4340.	-3.982	95.	-9.524	21.9	-5.771	1269.	-4.801	1965
1966	4200.	-3.226	86.	-9.474	20.5	-6.456	1250.	-1.497	1966
1967	4200.	0	104.	20.930	24.8	20.930	1277.	2.160	1967
1968	4000.	-4.762	85.	-18.269	21.3	-14.183	1208.	-5.403	1968
1969	3830.	-4.250	89.	4.706	23.2	9.353	1216.	.662	1969
1970	3827.	-.078	75.	-15.730	19.6	-15.664	1202.	-1.151	1970
1971	3904.	2.012	82.	9.333	21.0	7.177	1183.	-1.581	1971
1972	3900.	-.102	67.	-18.293	17.2	-18.209	1168.	-1.268	1972
1973	3900.	0	83.	23.881	21.3	23.881	1208.	3.425	1973
1974	4100.	5.128	53.	-36.145	12.9	-39.259	1137.	-5.877	1974
1975	4100.	0	88.	66.038	21.5	66.038	1076.	-5.365	1975
1976	4100.	0	96.	9.091	23.4	9.091	1067.	-.836	1976
1977	4000.	-2.439	83.	-13.542	20.7	-11.380	1062.	-.469	1977
1978	4000.	0	79.	-4.619	19.7	-4.819	948.	-10.734	1978
1979	3800.	-5.000	92.	16.456	24.2	22.585	948.	0	1979

MEAN -1.114

.350

1.266

-1.409

(MEANS COMPUTED FROM NON-ZERO ENTRIES ONLY)

55 SAGUACHE COUNTY, COLORADO

TABLE 55-2. GRADE LEVEL ENROLLMENT BY YEAR

YEAR	K	1	2	3	4	5	6	7	8	9	10	11	12	OTHER	TOTAL
61	0	151.	112.	126.	125.	113.	115.	132.	109.	94.	59.	61.	43.	0	1240.
62	0	155.	111.	112.	110.	114.	121.	148.	108.	88.	77.	54.	52.	0	1250.
63	0	155.	133.	119.	117.	115.	128.	152.	112.	98.	77.	82.	47.	0	1335.
64	0	116.	133.	122.	106.	121.	110.	159.	117.	99.	95.	66.	71.	18.	1333.
65	0	123.	97.	136.	111.	110.	116.	125.	117.	97.	91.	74.	56.	16.	1269.
66	40.	123.	102.	98.	122.	108.	98.	109.	110.	102.	94.	79.	65.	0	1250.
67	95.	125.	106.	98.	102.	103.	108.	98.	99.	96.	96.	78.	73.	0	1277.
68	100.	104.	106.	103.	100.	86.	96.	113.	85.	89.	86.	77.	63.	0	1208.
69	77.	124.	99.	101.	103.	94.	85.	108.	100.	93.	79.	81.	70.	2.	1216.
70	72.	113.	105.	105.	105.	96.	90.	79.	103.	101.	81.	78.	74.	0	1202.
71	73.	88.	99.	107.	105.	97.	98.	96.	89.	94.	102.	68.	66.	1.	1183.
72	73.	83.	90.	90.	116.	106.	92.	103.	91.	83.	86.	83.	69.	3.	1168.
73	79.	90.	70.	86.	92.	111.	100.	92.	100.	86.	82.	78.	73.	69.	1208.
74	78.	94.	74.	68.	86.	95.	121.	98.	93.	93.	76.	79.	77.	5.	1137.
75	55.	74.	88.	61.	74.	81.	85.	125.	98.	94.	95.	76.	70.	0	1076.
76	89.	79.	69.	79.	73.	60.	75.	84.	116.	103.	89.	86.	60.	5.	1067.
77	63.	110.	68.	72.	82.	70.	70.	84.	98.	102.	83.	83.	77.	0	1062.
78	66.	85.	79.	51.	68.	77.	65.	69.	65.	80.	98.	76.	69.	0	948.
79	86.	65.	68.	73.	55.	76.	72.	67.	70.	68.	84.	86.	75.	3.	948.
MEAN	75.	108.	95.	95.	97.	96.	97.	107.	99.	93.	86.	76.	66.	14.	1205.

(-0 ENTRY MEANS THAT THE DATA WERE NOT AVAILABLE.)
(MEANS ARE COMPUTED FROM THE NON-ZERO ENTRIES ONLY.)

TABLE 55-3. GRADE LEVEL ENROLLMENT AS A PERCENT OF TOTAL SCHOOL ENROLLMENT BY YEAR

YEAR	GRADE LEVEL														TOTAL
	K	1	2	3	4	5	6	7	8	9	10	11	12	OTHER	
61	0	12.2	9.0	10.2	10.1	9.1	9.3	10.6	8.8	7.6	4.8	4.9	3.5	0	100.0
62	0	12.4	8.9	9.0	8.8	9.1	9.7	11.8	8.6	7.0	6.2	4.3	4.2	0	100.0
63	0	11.6	10.0	8.9	8.8	8.6	9.6	11.4	8.4	7.3	5.8	6.1	3.5	0	100.0
64	0	8.7	10.0	9.2	8.0	9.1	8.3	11.9	8.8	7.4	7.1	5.0	5.3	1.4	100.0
65	0	9.7	7.6	10.7	8.7	8.7	9.1	9.9	9.2	7.6	7.2	5.8	4.4	1.3	100.0
66	3.2	9.8	8.2	7.8	9.8	8.6	7.8	8.7	8.8	8.2	7.5	6.3	5.2	0	100.0
67	7.4	9.8	8.3	7.7	8.0	8.1	8.5	7.7	7.8	7.5	7.5	6.1	5.7	0	100.0
68	8.3	8.6	8.8	8.5	8.3	7.1	7.9	9.4	7.0	7.4	7.1	6.4	5.2	0	100.0
69	6.3	10.2	8.1	8.3	8.5	7.7	7.0	8.9	8.2	7.6	6.5	6.7	5.8	.2	100.0
70	6.0	9.4	8.7	8.7	8.7	8.0	7.5	6.6	8.6	8.4	6.7	6.5	6.2	0	100.0
71	6.2	7.4	8.4	9.0	8.9	8.2	8.3	8.1	7.5	7.9	8.6	5.7	5.6	.1	100.0
72	6.3	7.1	7.7	7.7	9.9	9.1	7.9	8.8	7.8	7.1	7.4	7.1	5.9	.3	100.0
73	6.5	7.5	5.8	7.1	7.6	9.2	8.3	7.6	8.3	7.1	6.8	6.5	6.0	5.7	100.0
74	6.9	8.3	6.5	6.0	7.6	8.4	10.6	8.6	8.2	8.2	6.7	6.9	6.8	.4	100.0
75	5.1	6.9	8.2	5.7	6.9	7.5	7.9	11.6	9.1	8.7	8.8	7.1	6.5	0	100.0
76	8.3	7.4	6.5	7.4	6.8	5.6	7.0	7.9	10.9	9.7	8.3	8.1	5.6	.5	100.0
77	5.9	10.4	6.4	6.8	7.7	6.6	6.6	7.9	9.2	9.6	7.8	7.8	7.3	0	100.0
78	7.0	9.0	8.3	5.4	7.2	8.1	6.9	7.3	6.9	8.4	10.3	8.0	7.3	0	100.0
79	9.1	6.9	7.2	7.7	5.8	8.0	7.6	7.1	7.4	7.2	8.9	9.1	7.9	.3	100.0
MEAN	6.2	9.0	7.9	7.9	8.1	8.0	8.1	8.9	8.2	7.7	7.1	6.3	5.5	1.1	100.0

(-0 ENTRY MEANS THAT THE DATA WERE NOT AVAILABLE.)
(MEANS ARE COMPUTED FROM THE NON-ZERO ENTRIES ONLY.)

55 SAGUACHE COUNTY, COLORADO

TABLE 55-4. GRADE LEVEL ENROLLMENT AS A MULTIPLE OF ENROLLMENT IN THE NEXT LOWER GRADE LEVEL WITHIN THAT YEAR

YEAR	1/K	2/1	3/2	4/3	5/4	6/5	7/6	8/7	9/8	10/9	11/10	12/11
61	0	.742	1.125	.992	.904	1.018	1.148	.826	.862	.628	1.034	.705
62	0	.716	1.009	.982	1.036	1.061	1.223	.730	.815	.875	.701	.963
63	0	.858	.895	.983	.983	1.113	1.188	.737	.875	.786	1.065	.573
64	0	1.147	.917	.869	1.142	.909	1.445	.736	.846	.960	.695	1.076
65	0	.789	1.402	.816	.991	1.055	1.078	.936	.829	.938	.813	.757
66	3.075	.829	.961	1.245	.885	.907	1.112	1.009	.927	.922	.840	.823
67	1.316	.848	.925	1.041	1.010	1.049	.907	1.010	.970	1.000	.813	.936
68	1.040	1.019	.972	.971	.860	1.116	1.177	.752	1.047	.966	.895	.818
69	1.610	.798	1.020	1.020	.913	.904	1.271	.926	.930	.849	1.025	.864
70	1.569	.929	1.000	1.000	.914	.938	.878	1.304	.981	.802	.963	.949
71	1.205	1.125	1.081	.981	.924	1.010	.980	.927	1.056	1.085	.667	.971
72	1.137	1.084	1.000	1.289	.914	.868	1.120	.883	.912	1.036	.965	.831
73	1.139	.778	1.229	1.070	1.207	.901	.920	1.087	.860	.953	.951	.936
74	1.205	.787	.919	1.265	1.105	1.274	.810	.949	1.000	.817	1.039	.975
75	1.345	1.189	.693	1.213	1.095	1.049	1.471	.784	.959	1.011	.800	.921
76	.888	.873	1.145	.924	.822	1.250	1.120	1.381	.888	.864	.966	.698
77	1.746	.618	1.059	1.139	.854	1.000	1.200	1.167	1.041	.814	1.000	.928
78	1.288	.929	.646	1.333	1.132	.844	1.062	.942	1.231	1.225	.776	.908
79	.756	1.046	1.074	.753	1.382	.947	.931	1.045	.971	1.235	1.024	.872
MEAN	1.380	.900	1.004	1.047	1.004	1.011	1.107	.954	.947	.935	.896	.869

(-0 ENTRY MEANS THAT THE DATA WERE NOT AVAILABLE.)
(MEANS ARE COMPUTED FROM THE NON-ZERO ENTRIES ONLY.)

55 SAGUACHE COUNTY, COLORADO

TABLE 55-5. GRADE LEVEL ENROLLMENT AS A MULTIPLE OF THE ENROLLMENT IN THE PREVIOUS GRADE IN THE PREVIOUS YEAR

YEAR	K / 1	1 / 2	2 / 3	3 / 4	4 / 5	5 / 6	6 / 7	7 / 8	8 / 9	9 / 10	10 / 11	11 / 12
61/62	0	.735	1.000	.873	.912	1.071	1.287	.818	.807	.819	.915	.852
62/63	0	.858	1.072	1.045	1.045	1.123	1.256	.757	.907	.875	1.065	.870
63/64	0	.858	.917	.891	1.034	.957	1.242	.770	.884	.869	.857	.868
64/65	0	.836	1.023	.910	1.038	.959	1.136	.736	.829	.919	.779	.848
65/66	0	.829	1.010	.897	.973	.891	.940	.880	.872	.969	.868	.878
66/67	3.125	.862	.961	1.041	.844	1.000	1.000	.908	.873	.941	.830	.924
67/68	1.095	.848	.972	1.020	.843	.932	1.046	.867	.899	.896	.802	.808
68/69	1.240	.952	.953	1.000	.940	.988	1.125	.885	1.094	.888	.942	.909
69/70	1.468	.847	1.061	1.040	.932	.957	.929	.954	1.010	.871	.987	.914
70/71	1.222	.876	1.019	1.000	.924	1.021	1.067	1.127	.913	1.010	.840	.846
71/72	1.137	1.023	.909	1.084	1.010	.948	1.051	.948	.933	.915	.814	1.015
72/73	1.233	.843	.956	1.022	.957	.943	1.000	.971	.945	.988	.907	.880
73/74	1.190	.822	.971	1.000	1.033	1.090	.980	1.011	.930	.884	.963	.987
74/75	.949	.936	.824	1.088	.942	.895	1.033	1.000	1.011	1.022	1.000	.886
75/76	1.436	.932	.898	1.197	.811	.926	.988	.928	1.051	.947	.905	.789
76/77	1.236	.861	1.043	1.038	.959	1.167	1.120	1.167	.879	.806	.933	.895
77/78	1.349	.718	.750	.944	.939	.929	.986	.774	.816	.961	.916	.831
78/79	.985	.800	.924	1.078	1.118	.935	1.031	1.014	1.046	1.050	.878	.987
MEAN	1.212	.858	.959	1.009	.958	.985	1.068	.917	.928	.929	.900	.888

PRODUCT OF THE MEANS IS .641

(-0 ENTRY MEANS THAT THE DATA WERE NOT AVAILABLE.)

(MEANS ARE COMPUTED FROM THE NON-ZERO ENTRIES ONLY.)

*** FOR THIS COUNTY THE GRADE K/1 MULTIPLIERS FOR THE YEARS 61/62 THROUGH 66/67 WERE EXCLUDED FROM CALCULATION OF THE MEAN.

Data Sources

1. Population:

- a. "Population by Counties 1920-1960 "Bureau of Business Research
School of Business, University of Colorado, Boulder, Colorado.
- b. "Population by County-Colorado Selected Years (1940-1977)"
Colorado Department of Health, 4210 East Eleventh Avenue,
Denver, Colorado
- c. "County Population Estimates 1961-1969," COLORADO POPULATION
TRENDS, Vol. 2, No. 2, Spring 1973. Business Research
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- d. COLORADO POPULATION REPORTS, POPULATION ESTIMATES, Series
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- e. COLORADO POPULATION REPORTS, POPULATION ESTIMATES, Series
CP-25, No. 79(a)-1, March, 1979, Colorado Division of
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- f. COLORADO POPULATION REPORTS, POPULATION ESTIMATES, Series
CP-25 No. 79(A)-3, August, 1979, Colorado Division of
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Street, Denver, Colorado.

2. Live Births:

- a. "Number of Births by County of Residence, 1940-1979,"
Colorado Department of Health, 4210 East Eleventh Ave.,
Denver, Colorado

3. School Enrollments:

- a. Thirty-Seventh Biennial Report of the State Commissioner of
Education of the State of Colorado for the Years July 1,
1948 to June 30, 1950, Colorado Department of Education,
Denver, Colorado
- b. Thirty-Eighth Biennial Report of the State Commissioner of
Education of the State of Colorado for the Years July 1,
1950 to June 30, 1952, Colorado Department of Education,
Denver, Colorado

- c. THESE ARE YOUR SCHOOLS, Thirty-Ninth Biennial Report of the State Commissioner of Education of the State of Colorado for the Years 1952-53 to 1953-54, Colorado Department of Education, Denver, Colorado.
- d. PUBLIC EDUCATION IN COLORADO, Fortieth Biennial Report of the Commissioner of Education of the State of Colorado for the Years 1954-55 to 1955-56, Colorado Department of Education, Denver, Colorado, June 30, 1956.
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