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POPULATION, LABOR FORCE AND
UNEMPLOYMENT PROJECTIONS

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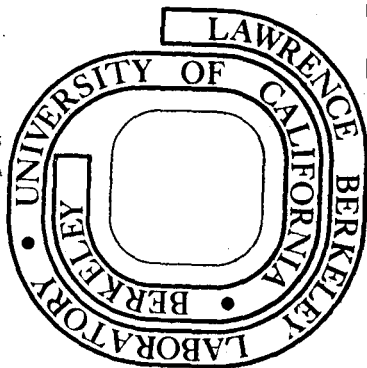
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POPULATION, LABOR FORCE
AND
UNEMPLOYMENT PROJECTIONS

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A B S T R A C T

In an effort to supply local planners in CETA projects with estimates of persons in need of manpower services, the Labor Market Projections Model (LMPM) was developed at Lawrence Berkeley Laboratory (LBL) in cooperation with the Department of Labor - Employment and Training Administration (DOL-ETA), to project the "current" population, labor force and unemployment by race by sex by five year age cohort, at the local level. The goal of LMPM is to provide a comprehensive modeling system to be used by local analysts. LMPM is a computerized model that integrates data from several sources (1970 fourth count census, 1960-1970 net migration, etc.) and for a variety of geographic areas (states, SMSAs, and prime sponsors).

Work supported by the U. S. Department of Energy.

I N T R O D U C T I O N

A need for data representing current and future population, labor force, and/or unemployment at a local level (county, city, etc.) has long existed. The recent trend toward the decentralization of Federal programs in the 1970's, as reflected in legislation such as the Comprehensive Employment and Training Act of 1973 (CETA), has brought about an increasing demand for information on racial, sex, and age characteristics of the population, labor force, and unemployed at the local level. Traditionally local planners have used population projections to determine the need for new or expanded schools, the types and number of housing units required, etc. Now, legislation, such as CETA, allocates funds to local jurisdictions (referred to as prime sponsors, each of which is an area with at least 100,000 population) and places the responsibility to provide job training and employment opportunities for economically disadvantaged, unemployed, and underemployed persons on local governments. As a result, emphasis on local labor force and unemployment projections has grown, since local planners require such data in determining which groups are most in need of assistance. Additionally, labor force and unemployment projections may be used to measure the impacts or closings of businesses on the local economy.

While every ten years, the decennial census provides an excellent source of local information at a point in time, its value as a measure of current or future components as dynamic as population, labor force, and unemployment, particularly as a source of data for use in the design of local strategies intended to alleviate unemployment and to improve local economies, must be brought into question. While the census serves as a valuable benchmark, the need to update and project information beyond the census year is clear. To fill this gap, Lawrence Berkeley Laboratory and the U. S. Department of Labor - Employment and Training Administration, have developed a projections procedure, entitled, the Labor Market Projections Model (LMPM). Building this model (Guidelines, 1976) necessitated the collection and integration of data from several diverse sources to form a comprehensive data base. Using standard demographic techniques and combining and manipulating elements of this data base, population, labor force, and unemployment projections for the desired geareas were developed.

M E T H O D O L O G Y

The population projections are calculated using a refined cohort component method. This involves the separate projections of births, deaths, and net migration to give population by race by sex by five year age cohorts for a particular area (Ghyrock, 1973). Using total population projections for the target year as received from the Bureau of the Census, these cohort projections are then normalized to add up to a control total for that area. The control projections assume a continuation of post-1970 population trends and thus a continuation of recent net migration trends. A step-down method is used to develop sub-national projections for state, counties, and sub-county areas. (Guidelines, 1975) In more detail, the steps involved in calculating the population projections are as follows:

- (1) Calculate the expected number of survivors in April 1975 by multiplying the 1970 population by the national five year survival rate.
- (2) Calculate the expected number of births from 1970-1975.
- (3) Multiply the expected number of survivors by a five year net migration rate to determine the net migration from 1970 to 1975.
- (4) Add the number of survivors in April 1975 to the number of migrants to get an estimated area distribution for April 1975.
- (5) Normalize these estimates to add up to a population control total as provided by the Bureau of the Census.

Tables I and II show the population projections for the state of California.

Mathematically, the population projections may be expressed as follows. For a particular gearea, let

$P(i,j,k)$ = the population of race i , sex j , age cohort k in 1970,

$S(j,k)$ = the nation five year survival rate for sex j from age cohort $k-1$ to age cohort k ,

$M(i,j,k)$ = the area ten year net migration rate for race i , sex j , age cohort k ,

$PP(i,j,k)$ = the estimated population for April 1975 for race i , sex j , age cohort k ,

$POP76$ = the projected total population for the area in January, 1976, and

$POP(i,j,k)$ = the normalized population estimates for January 1978 for race i , sex j , age cohort k .

Then, $PP(i,j,k)$ (column 7 in Tables I and II) may be calculated by the following equation.

$$PP(i,j,k) = P(i,j,k) * S(j,k) * [1 + .5 * M(i,j,k)] \quad (1)$$

These estimates are made to add up to the desired control total, $POP76$, to obtain $POP(i,j,k)$, as follows.

$$POP(i,j,k) = PP(i,j,k) + [POP76 / \sum_i \sum_j \sum_k PP(i,j,k)] \quad (2)$$

The labor force and unemployment projections are based on the labor force and unemployment of the gearea in the base year, national changes in the labor force and

unemployment from the base year to the target year, and the population projections for the target year as calculated above. In more detail, the steps involved in calculating the labor force projections are as follows:

- (1) Calculate the labor force participation rates in the geosarea of interest in April 1970, by race by sex by age cohort. This data is available in the 1970 Fourth Count Census.
- (2) Multiply these participation rates by a national adjustment factor (Tomorrow, 1969). This factor is a combination of two factors. First, the national labor force participation rates are adjusted to the Current Population Survey (CPS) March-April 1970 rate. A March-April average is used because the decennial Census labor force reference week was not the same for all respondents and reference weeks could have been in either March or April. This step is necessary as the CPS provides a more accurate estimate of labor force participation than does the decennial Census. Second, the 1970 March-April CPS average is adjusted to the 1970 annual CPS average.
- (3) The 1970 adjusted labor force participation rates are multiplied by a factor representing the national change in labor force participation rates from 1970 to 1975, resulting in area labor force participation rates for 1975. (1975 was the latest year for which such data was available.) It is assumed that these labor force participation rates are also valid for the target year - January 1, 1978, in our case.

- (4) Multiply by the population projections already obtained to obtain estimates of the labor force by race by sex by age cohort.
- (5) Normalize these estimates to add up to a labor force control total as provided by the state containing the gearea of interest.

Tables III and IV show the labor force composition projections for California.

Mathematically, the labor force projections may be expressed as follows. The definitions given above for the population projections are still applicable. In addition, for a particular gearea, let

$L(i,j,k)$ = the labor force of race i , sex j , age cohort k in 1970,

$LP(i,j,k)$ = the labor force participation rate of race i , sex j , age cohort k in 1970,

$A(i,j,k)$ = the adjustment factor for labor force participation from the 1970 Census to the 1970 average CPS for race i , sex j , age cohort k , cohort k ,

$C(i,j,k)$ = national change in the labor force participation rate for race i , sex j , age cohort k , from 1970 to 1975,

$L78(i,j,k)$ = preliminary estimate of the 1978 labor force for race i , sex j , age cohort k ,

LF = the projected total labor force for the area in January 1, 1978, and,

$LF78(i,j,k)$ = projected 1978 labor force for race i , sex j ,
and age cohort k .

Then, $L78(i,j,k)$ (column 9 in Tables III and IV) may
be calculated by the following equation.

$$L78(i,j,k) = LR(i,j,k) * A(i,j,k) * C(i,j,k) * POP(i,j,k) \quad (3)$$

where

$$LR(i,j,k) = L(i,j,k) / P(i,j,k). \quad (4)$$

These preliminary estimates are made to add up the desired
control total, LF , to obtain $LF78(i,j,k)$, as follows.

$$LF78(i,j,k) = L78(i,j,k) * [LF / \sum_i \sum_j \sum_k L78(i,j,k)] \quad (5)$$

Both population and labor force projections are done
by race by sex by age cohort. In general, unemployment
projections are done only by race and by sex. In order to
include an age breakdown as well, data must be obtained from
the 1970 Sixth Count Census. However, the Sixth Count covers
only states, SMSAs, SMSA counties, and cities of 50,000 or
more people within an SMSA. Not only is the coverage rather
limited, but furthermore the definitions of many SMSA's have
changed considerably since 1970, making some of the existing
data useless. The steps taken to calculate unemployment
projections by race and by sex are as follows:

- (1) Calculate the unemployment rates in the geoarea in
1970.
- (2) Calculate the ratio of the unemployment rate of each
race/sex cohort to the total unemployment rate for the
geoarea.

- (3) Multiply these ratios by the national change for each race/sex cohort from 1970 to 1975.
- (4) Multiply these 1975 ratios by the 1977 total unemployment rate for the geogrea, as provided by the state containing the geogrea. This results in an estimated 1977 unemployment rate for each race/sex cohort.
- (5) Multiply these unemployment rates by the labor force in each race/sex cohort as already obtained, to get unemployment estimates.
- (6) Since the state has provided a total labor force figure and an unemployment rate, it is trivial to calculate the total number of unemployed and normalize the estimates just calculated so that they add up to this total unemployment figure.

At the end of Table IV is the unemployment projection for California. If data from the 1970 Sixth Count Census does exist for the geogrea of interest and unemployment by race by sex by age cohort is desired, the calculations follow the same pattern as just outlined. However, in step (3), the national change for each race/sex/age cohort is used.

Mathematically, the unemployment composition projections may be expressed as follows. The definitions as given for the population and labor force compositions projections are still applicable; however, the third index, k , is no longer necessary as in general, unemployment projections are calculated by race and by sex. In addition, let

$L(i,j)$ = the number of unemployed of race i and sex j in 1970,

$U70$ = the total unemployment rate for the geoarea in 1970,

$CU(i,j)$ = the national change in the unemployment rate from 1970 to 1975 for race i and sex j ,

$U78$ = the projected total unemployment rate for 1978,

$UNEMP$ = the projected number of unemployed for 1978,

$EU(i,j)$ = preliminary estimates of the number of unemployed in 1978 of race i and sex j , and

$PU(i,j)$ = projected unemployment in 1978 of race i and sex j .

Then $EU(i,j)$ (column 9 at the bottom of Table IV), may be calculated as

$$EU(i,j) = ([EU(i,j)]/L(i,j)]/U70) * CU(i,j) * U78 * LF(i,j). \quad (6)$$

These preliminary estimates are made to add up to the desired control total, $UNEMP$, to obtain $PU(i,j)$, as follows

$$PU(i,j) = EU(i,j) * [LF / \sum_i \sum_j EU(i,j)]. \quad (7)$$

DATA SOURCES

In order to implement this model, data from several different data sources had to be collected and integrated into a data base. The computer program that calculated the projections operates on this data base. The various data sources are as follows:

- (1) 1970 population by race by sex by age cohort from Tabulation 17 of the 1970 Fourth Count Census
- (2) 1970 labor force by race by sex by age cohort from Tabulation 55 of the 1970 Fourth Count Census
- (3) 1970 unemployment by race by sex from Tabulation 54 of the 1970 Fourth Count Census
- (4) 1970 unemployment by race by sex by age cohort from Tabulation 1150 of the 1970 Sixth Count Census
- (5) 1960-1970 net migration by race by sex by age cohort at the county level (Bowles, 1974)
- (6) National survival rates for 1970-1975 by age by sex (Current Population Reports, 1972)
- (7) National Fertility Data by age by race (Vital Statistics of the U.S., 1971)
- (8) Projections of Resident Population for January 1978 for states, counties, MCE's in New England, and cities with 50,000+ in 1973 (Gibson, 1976)
- (9) Total labor force participation rates and unemployment rates for geareas of interest, provided by the states
- (10) Census to annual CPS adjustment factor by race by sex by age cohort (Employment and Earnings, 1976)

- (11) National change in labor force participation rates by race by sex by age cohort from 1970 to 1975
(Employment and Earnings, 1976)
- (12) National change in ratio of race/sex unemployment rate to total unemployment rate from 1970 to 1975
(Employment and Earnings, 1976)
- (13) National change in ratio of race/sex/age cohort unemployment rate to total race/sex unemployment rate from 1970 to 1975 (Employment and Earnings, 1976)

I M P R O V E M E N T S

Several refinements are currently being made to improve the model. The computer program that calculates the projections is being made interactive. Then the user can get instant results as well as try different control totals and/or different data. A second refinement is to improve the data sources. Presently, the national labor change and unemployment change vectors from 1970 to 1975 are being replaced by state labor force and unemployment change vectors. This data can be obtained from the Current Population Survey tapes. Since the migration data being used is out-of-date, work is being done to develop a migration submodel. If a user is aware of more current migration data for the areas in which s/he is interested, s/he can substitute that for what is currently in the data base. This is when the interactive version of the model is particularly useful. A third refinement is to expand the number of races from two to three. The projections will be calculated for white, black, and other instead of just white and nonwhite as is currently done.

C O N C L U S I O N

With the development of LMPM, a computerized model has been built that will provide current estimates of "local" population, labor force, and unemployment. Since LBL worked in cooperation with DCL-FTA to build this model, it presently runs for all states, SMSAs, and prime sponsors. However, it could easily be run for any geosarea for which the necessary data exists. The population projections could be run for any county in the United States, or for any city with 50,000 people or more.

R E F E R E N C E S

- Bowles, Gladys K., "Net Migration of the Population, 1960 - 1970 by Age, Sex and Color", U. S. Department of Agriculture, Economic Research Service; University of Georgia, Institute for Behavioral Research; and National Science Foundation, Research Applied to National Needs, cooperating
- Chung, Hyung S., "Projection Methodology for Manpower Planning in Labor Market Areas", Joint Publications of Connecticut Manpower Executives Association, City of Hartford Manpower Planning and Co-ordination Agency, University Research Institute of Connecticut, and Long Term Job Market Information Center, University of Bridgeport, 1973
- Current Population Reports, December 1972, "Population Estimates and Projections Series F-25, No. 493, table 8-5
- Employment and Earnings, January 1976
- Gibson, Cam, 1976, "Projections of Resident Population for January 1978 for the Manpower Administration, Bureau of the Census
- Labor Market Information Guidelines, U. S. Department of Labor - Employment and Training Administration, chapters III and IV, 1975

Pittenger, Donald, Projecting State and Local Populations,
Ballinger Publishing Company, Cambridge, Massachusetts,
1976

Shyrock, Henry, Siegel, Jacob and Associates, 1973, The
Methods and Materials of Demography, U. S. Department of
Commerce

Tarver, James D., and Black, Theres R., "Making County
Projections - A Detailed Explanation of a Three -
Component Method, Illustrated by Reference to Utah
Counties", Utah Agricultural Experiment Stations
Bulletin No. 459

Tomorrow's Manpower Needs, U. S. Department of Labor -
Bureau of Labor Statistics, pages 16-21, 1969

Vital Statistics of the United States, 1971, Volume 1 -
Natality; Table 1-6: U. S. Department of H. E. W.

Table I

POPULATION COMPOSITION PROJECTIONS STATE OF CALIFORNIA

JANUARY 1, 1978

CALCULATIONS FOR WHITE MALES

TOTAL POPULATION PROJECTION 21620450

AGE COHORTS	AREA POPULATION APRIL 1, 1970	NATIONAL FIVE YEAR SURVIVAL RATES	EXP NUMBER OF SURVIVORS APRIL 1, 1975	AREA TEN YEAR NET MIGRATION RATE	NET MIGRATION 1970-1975	AREA POPULATION APRIL 1, 1975	PERCENT DISTRIBUTION APRIL 1, 1975	POPULATION PROJECTION JAN. 1, 1978
BIRTHS		.977536						
0-4	728583	.998465	818262	-.0130	-5319	812943	.0364	786272
5-9	857481	.997803	726007	.0530	19239	745247	.0333	720797
10-14	881738	.995070	835557	.1000	42780	898377	.0402	868903
15-19	833705	.990384	877391	.1150	50450	927841	.0415	897400
20-24	769427	.989478	825688	.1900	78440	904128	.0404	874466
25-29	642669	.989592	761331	.2600	98773	860304	.0385	832079
30-34	541035	.987119	636044	.1930	61379	697423	.0312	674542
35-39	512252	.981037	534066	.1220	32578	566644	.0253	548053
40-44	536720	.970752	502539	.0870	21860	524399	.0235	507194
45-49	549237	.954383	521022	.0590	17715	538737	.0241	521062
50-54	485653	.930882	524457	.0550	14423	538880	.0241	521200
55-59	414155	.893099	452086	.0420	9434	461579	.0206	446436
60-64	334303	.843550	359881	.0380	7029	376319	.0169	364543
65-69	254498	.779330	282001	.0440	6204	288205	.0129	278750
70-74	189578	.698616	198338	.0520	6148	204486	.0091	197778
75 +	248662	.504074	257786	.0710	9151	266938	.0119	258180
TOTAL						9613340		9297654

POPULATION COMPOSITION PROJECTIONS STATE OF CALIFORNIA

JANUARY 1, 1978

CALCULATIONS FOR WHITE FEMALES

TOTAL POPULATION PROJECTION 21620450

AGE COHORTS	AREA POPULATION APRIL 1, 1970	NATIONAL FIVE YEAR SURVIVAL RATES	EXP NUMBER OF SURVIVORS APRIL 1, 1975	AREA TEN YEAR NET MIGRATION RATE	NET MIGRATION 1970-1975	AREA POPULATION APRIL 1, 1975	PERCENT DISTRIBUTION APRIL 1, 1975	POPULATION PROJECTION JAN. 1, 1978
BIRTHS		.982138						
0-4	699855	.997241	778615	-.0140	-5450	773164	.0346	747798
5-9	828115	.998528	697924	.0520	18145	716070	.0320	692577
10-14	847908	.997810	825895	.1080	44652	871548	.0390	842955
15-19	793956	.996649	845051	.0970	41033	887085	.0397	857981
20-24	742232	.995013	791295	.2030	80316	871612	.0390	843016
25-29	644034	.994799	759193	.3320	125026	885219	.0396	856177
30-34	532006	.992589	640584	.2280	73038	713722	.0319	690307
35-39	506597	.983883	528063	.1300	34324	562387	.0252	543937
40-44	548572	.983307	500965	.1030	25800	526765	.0236	509483
45-49	576848	.975232	539415	.0770	20767	560182	.0251	541804
50-54	506386	.965217	562561	.0630	17721	580281	.0260	561243
55-59	447408	.948579	488772	.0510	12454	501236	.0224	484791
60-64	381249	.921060	424402	.0530	11247	435648	.0195	421356
65-69	320560	.878601	351153	.0730	12817	363970	.0163	352029
70-74	265645	.805516	281644	.0830	11688	293333	.0131	283709
75 +	414110	.563374	447307	.0820	18340	465646	.0208	450369
TOTAL						10007870		9679531

Table II

POPULATION COMPOSITION PROJECTIONS STATE OF CALIFORNIA

JANUARY 1, 1978

CALCULATIONS FOR NONWHITE MALES

TOTAL POPULATION PROJECTION 21620450

AGE COHORTS	AREA POPULATION APRIL 1, 1970	NATIONAL FIVE YEAR SURVIVAL RATES	EXP. NUMBER OF SURVIVORS APRIL 1, 1975	AREA TEN YEAR NET MIGRATION RATE	NET MIGRATION 1970-1975	AREA POPULATION APRIL 1, 1975	PERCENT DISTRIBUTION APRIL 1, 1975	POPULATION PROJECTION JAN. 1, 1978
BIRTHS		.977536						
0-4	106718	.956465	157354	.0840	5609	163963	.0073	158583
5-9	121760	.957803	105341	.2110	11219	117760	.0053	113703
10-14	118243	.995070	121492	.2900	17616	139109	.0062	134545
15-19	104408	.990384	117660	.3390	19943	137603	.0062	133089
20-24	90278	.989478	103404	.5900	30504	133908	.0060	129515
25-29	75489	.989692	89328	.8480	37875	127203	.0057	123030
30-34	70435	.987119	74711	.4600	17183	91894	.0041	88879
35-39	65111	.981037	69728	.2960	10290	79818	.0036	77199
40-44	60376	.970752	63876	.2240	7154	71030	.0032	68700
45-49	55892	.954833	38410	.1690	4953	63563	.0028	61477
50-54	44564	.930882	53370	.1460	3896	57266	.0026	55388
55-59	38161	.893099	41484	.1310	2717	44201	.0020	42751
60-64	31346	.843550	34082	.1260	2147	36229	.0016	35040
65-69	23856	.779330	26442	.1620	2142	28584	.0013	27646
70-74	14868	.598515	18592	.1050	976	19568	.0009	18926
75 +	16342	.504074	18625	.2690	2505	21130	.0009	20436
TOTAL						1332629		1288908

POPULATION COMPOSITION PROJECTIONS STATE OF CALIFORNIA

JANUARY 1, 1978

CALCULATIONS FOR NONWHITE FEMALES

TOTAL POPULATION PROJECTION 21620450

AGE COHORTS	AREA POPULATION APRIL 1, 1970	NATIONAL FIVE YEAR SURVIVAL RATES	EXP. NUMBER OF SURVIVORS APRIL 1, 1975	AREA TEN YEAR NET MIGRATION RATE	NET MIGRATION 1970-1975	AREA POPULATION APRIL 1, 1975	PERCENT DISTRIBUTION APRIL 1, 1975	POPULATION PROJECTION JAN. 1, 1978
BIRTHS		.982188						
0-4	104662	.997241	153798	.0820	6306	160104	.0072	154852
5-9	119476	.998528	104373	.2150	11220	115593	.0052	111801
10-14	117222	.997810	119300	.2990	17835	137136	.0061	132636
15-19	99878	.995549	116955	.3020	17662	134627	.0060	130210
20-24	96087	.996013	99543	.6250	31107	130651	.0058	126364
25-29	82796	.994799	95704	.9660	44225	141929	.0063	137272
30-34	76399	.992589	82365	.5790	23845	106210	.0048	102726
35-39	70866	.988883	75833	.4240	16077	91909	.0041	88894
40-44	68082	.983307	70078	.2830	9916	79994	.0035	77370
45-49	59062	.975232	65946	.2060	6895	73841	.0033	71418
50-54	46464	.965217	57799	.1730	4982	52531	.0028	60528
55-59	37114	.943579	44848	.1810	4059	48907	.0022	47302
60-64	27797	.921060	35206	.1920	3390	38585	.0017	37319
65-69	24010	.876601	25603	.2590	3316	28918	.0013	27970
70-74	15308	.805616	21095	.1890	1993	23089	.0010	22331
75 +	19468	.563374	23300	.2510	2924	25224	.0012	25364
TOTAL						1400299		1354358

Table III

LABOR FORCE COMPOSITION PROJECTIONS STATE OF CALIFORNIA
CALCULATIONS FOR WHITE MALES

FY 1978 LABOR FORCE PARTICIPATION RATE 62.9
FY 1978 TOTAL LABOR FORCE 9914000

AGE	AREA POPULATION 1970	PERSONS IN L F 1970	L F PART RATE 1970	ADJ TO CPS ANN AV	ADJUSTED L F PART RATE	CHANGE IN L F P R 1975/1970	L F PART RATE 1975	AREA POP 1978	UNCONTROLLED NO IN LF 1978	PERCENT CONTROLLED DISTRI B LF 1978	CONTROLLED NO IN LF 1978	AREA 1978 L F P R
16-17	336650	126655	37.6	1.294	48.7	1.059	51.6	358960	185063	.019	184537	51.4
18-19	324219	223328	68.0	1.103	75.0	1.080	81.0	358960	290587	.029	289762	80.7
20-24	769427	635321	82.6	1.021	84.3	1.026	86.5	874466	756383	.076	754234	86.3
25-34	1183704	1104511	93.3	1.021	95.3	.991	94.4	1305621	1422428	.143	1418387	94.1
35-44	1048972	998100	95.2	1.018	95.9	.991	96.0	1055247	1012945	.102	1010067	95.7
45-64	1783348	1559612	87.5	1.020	89.2	.948	84.6	1853241	1567187	.158	1562735	84.3
65 +	692738	148554	21.5	1.072	23.1	.816	18.8	734707	138229	.014	137836	18.8
TOTAL									5372823		5357559	

LABOR FORCE COMPOSITION PROJECTIONS STATE OF CALIFORNIA
CALCULATIONS FOR WHITE FEMALES

FY 1978 LABOR FORCE PARTICIPATION RATE 62.9
FY 1978 TOTAL LABOR FORCE 9914000

AGE	AREA POPULATION 1970	PERSONS IN L F 1970	L F PART RATE 1970	ADJ TO CPS ANN AV	ADJUSTED L F PART RATE	CHANGE IN L F P R 1975/1970	L F PART RATE 1975	AREA POP 1978	UNCONTROLLED NO IN LF 1978	PERCENT CONTROLLED DISTRI B LF 1978	CONTROLLED NO IN LF 1978	AREA 1978 L F P R
16-17	324664	57904	20.9	1.494	31.2	1.167	36.5	343192	125147	.013	124791	36.4
18-19	302662	152134	50.3	1.125	56.5	1.098	62.1	343192	213089	.021	212484	61.9
20-24	762232	434915	57.1	1.029	58.7	1.133	66.5	843016	550787	.056	559194	66.3
25-34	1176040	540367	45.9	1.007	46.3	1.238	57.3	1546483	885854	.089	883337	57.1
35-44	1055169	527301	50.0	1.018	50.9	1.100	55.0	1053419	589493	.059	587818	55.8
45-64	1911891	899723	47.1	1.030	48.5	.985	47.8	2009194	960244	.097	957515	47.7
65 +	1000315	86421	8.6	.969	8.4	1.188	9.9	1086107	108018	.011	107711	9.9
TOTAL									3442632		3432851	

Table IV

LABOR FORCE COMPOSITION PROJECTIONS STATE OF CALIFORNIA
CALCULATIONS FOR NONWHITE MALES

FY 1978 LABOR FORCE PARTICIPATION RATE 62.9
FY 1978 TOTAL LABOR FORCE 9914000

AGE	AREA POPULATION 1970	PERSONS IN L F 1970	L F PART RATE 1970	ADJ TO CPS ANN AV	ADJUSTED L F PART RATE	CHANGE IN L F P R 1975/1970	L F PART RATE 1975	AREA POP 1978	UNCONTROLLED NO IN L F 1978	PERCENT CONTROLLED DISTRIB LF 1978	CONTROLLED NO IN L F 1978	AREA 1978 L F P R
16-17	41523	9888	23.8	1.547	36.8	.865	31.9	53235	16964	.002	16916	31.8
18-19	40740	22715	55.8	1.198	55.8	.930	62.1	53236	33071	.003	32977	61.9
20-24	90278	67079	74.3	1.104	82.0	.939	77.0	129515	99761	.010	99477	76.8
25-34	145924	126822	86.9	1.071	93.1	.975	90.8	211909	192315	.019	191768	90.5
35-44	125487	112400	89.6	1.054	94.4	.966	91.2	145899	133057	.013	132679	90.9
45-64	169963	139131	81.9	1.055	86.4	.923	79.7	194556	155164	.016	154723	79.5
65 +	55066	13653	24.8	1.156	28.7	.763	21.9	67008	14665	.001	14623	21.8
TOTAL									644996		643164	

LABOR FORCE COMPOSITION PROJECTIONS STATE OF CALIFORNIA
CALCULATIONS FOR NONWHITE FEMALES

FY 1978 LABOR FORCE PARTICIPATION RATE 62.9
FY 1978 TOTAL LABOR FORCE 9914000

AGE	AREA POPULATION 1970	PERSONS IN L F 1970	L F PART RATE 1970	ADJ TO CPS ANN AV	ADJUSTED L F PART RATE	CHANGE IN L F P R 1975/1970	L F PART RATE 1975	AREA POP 1978	UNCONTROLLED NO IN L F 1978	PERCENT CONTROLLED DISTRIB LF 1978	CONTROLLED NO IN L F 1978	AREA 1978 L F P R
16-17	39564	5842	14.8	1.700	25.1	1.091	27.4	52084	14264	.001	14223	27.3
18-19	38688	16208	41.9	1.173	49.1	1.009	49.6	52084	25825	.003	25752	49.4
20-24	96087	55823	58.1	1.032	60.0	.974	58.4	126364	73792	.007	73583	58.2
25-34	159195	89938	56.5	1.000	56.5	1.066	60.3	239998	144617	.015	144206	60.1
35-44	138948	79460	57.2	1.007	57.6	1.080	62.2	155254	103406	.010	103113	62.0
45-64	170437	91123	52.9	1.050	55.5	.936	52.0	216568	112549	.011	112229	51.8
65 +	58786	7062	12.0	.938	11.3	.861	9.7	75665	7341	.001	7320	9.7
TOTAL									481795		480426	

STATE OF CALIFORNIA

NUMBER OF UNEMPLOYED BY RACE/SEX

FY 1978 ASSUMED TOTAL UNEMPLOYMENT RATE 8.40
FY 1978 AVERAGE NUMBER OF UNEMPLOYED 832776

RACE/SEX COHORT	1970 PERSONS IN L F	1970 PERSONS UNEMP	1970 UNEMP RATE	RATIO COHORT TO TOTAL	NATIONAL CHANGE 70 - 75	1975 AREA RATIO	1978 GUESSED U. R.	1978 LABOR FORCE	1978 GUESSED UNEMP	1978 PERCENT DISTRIB	1978 CONTROL UNEMP	1978 CONTROL U. R.
TOTAL	7992168	507478	6.3	1.0000	1.000	1.000	8.4	9914000	832776		832776	
WHITE MALE	4490678	256613	5.7	.8999	1.038	.934	7.8	5357559	420395	.508	422971	7.9
WHITE FEMALE	2703279	183585	6.8	1.0701	.918	.982	8.3	3432851	283274	.342	285010	8.3
NONWHITE MALE	454517	38548	8.5	1.3357	1.082	1.445	12.1	643154	78078	.094	78556	12.2
NONWHITE FEMALE	343694	28532	8.3	1.3120	.868	1.130	9.6	480426	45957	.056	46239	9.6
TOTAL									827704			

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