

Matching Death Master File with Missouri Voter Registration Data

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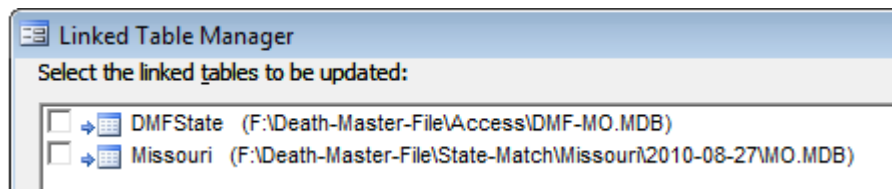
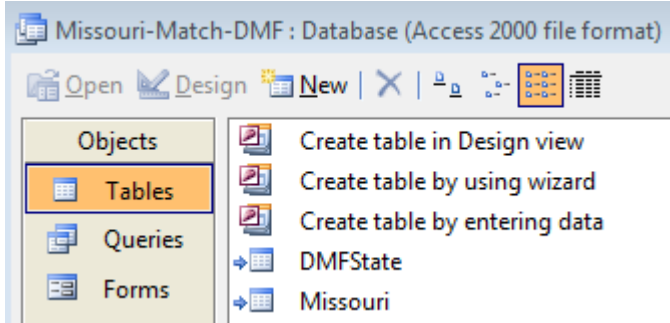
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Tables

Access file **Missouri-Match-DMF.mdb**.

In Missouri voter table make sure "Last Name" and "Birthdate" are indexed "Yes (Duplicates OK)" and that "Voter ID" is the primary key.

NOTE: In August 2010 data "Voter ID" is not unique statewide in Missouri and must be set to indexed "Yes (Duplicates OK)". There are 27 duplicate entries. The Missouri Secretary of State should be informed to get this fixed.

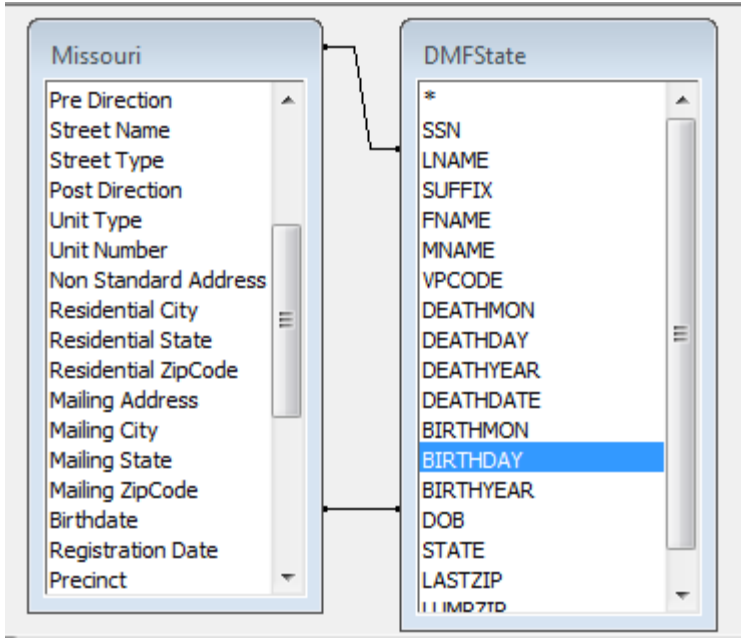


"Minimal Match"

The first filter is to match two files based only on last name and date of birth. This will result in some duplicates and false hits.

Join state table with DMFState on last name and date of birth fields in query "**1Make-Matchlist**".

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Make Table

Make New Table

Table Name:

Current Database

Add DMFState fields to state table fields:

SSN	VPCODE	Birthdate	DEATHDATE	STATE	LASTZIP	LUMPZIP
DMFState	DMFState	Missouri	DMFState	DMFState	DMFState	DMFState

FNAME	MNAME	LNAME	SUFFIX	First Name	Middle Name	Last Name	Suffix
DMFState	DMFState	DMFState	DMFState	Missouri	Missouri	Missouri	Missouri

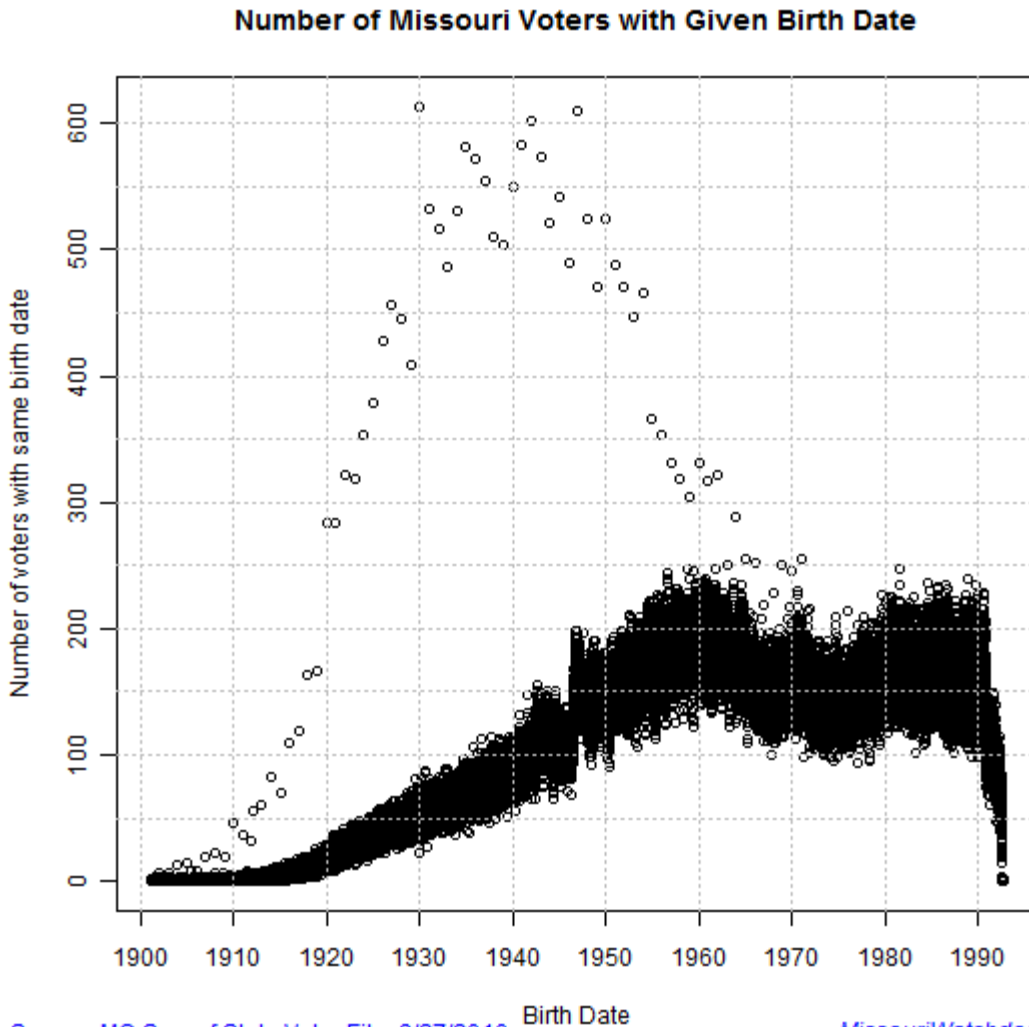
Query took about two hours and creates **MatchList table**.

82,722 records in minimal match

Can result in duplicate SSNs and voter IDs.

A match on the birthdate alone limits the potential pool of voters to consider to no more than about 200-250. See chart below.

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Research the "outliers" in the above chart -- many appear to be Jan. 1 birthdates from Somali refugees. Somali voters were researched as part of Missouri House 40 contested election.

See:

- [New Year's birthdays aplenty](#), *Los Angeles Times*, Jan. 1, 2010.
- [Culture note for refugees: Happy New Year birthday](#), *Boston Globe*, Jan. 1, 2009.

The 4,115,199 Missouri voters (Aug 27, 2010 data) share about 31,588 birthdates for an average of about 130 voters for any given date.

Match Scoring

Query: **2Make-Scoring** → **Scoring Table**

82,722 records

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age: Round(((DeathDate)-[Birthdate])/365.25,1)

FNAMEscore: Iif((Len([First Name])>1) And (Len([FNAME])>1),Iif([First Name]=[FNAME],256,0),Iif([First Name]=[FNAME],128,Iif((Left([First Name],1)=[FNAME]) Or (Left([FNAME],1)=[First Name]),64,0))))

MixNamescore: Iif(((Len([First Name])>1) And ([First Name]=[MNAME])) Or ((Len([FNAME])>1) And ([FNAME]=[Middle Name])),32,0)

Suffixscore: Iif([DMFState_SUFFIX]=[Missouri_Suffix],16,0)

ZIPscore: Iif((([Residential ZipCode]=[LASTZIP]) Or ([Residential ZipCode]=[LUMPZIP]),8,0)

MNAMEscore: Iif((Len([Middle Name])>1) And (Len([MNAME])>1),Iif([Middle Name]=[MNAME],4,0),Iif([Middle Name]=[MNAME],2,Iif((Left([Middle Name],1)=[MNAME]) Or (Left([MNAME],1)=[Middle Name]),1,0))))

TotalScore: [FNAMEscore]+[MixNamescore]+[Suffixscore]+[ZIPscore]+[MNAMEscore]

FNAME match, > 1	FNAME match, = 1	FNAME initials match	FNAME and MNAME mixed	Suffix match	ZIP match	MNAME match, > 1	MNAME match, = 1	MNAME initials match
256	128	64	32	16	8	4	2	1

This binary scoring system allows one to determine what matched and what didn't match. For example, a score of 264 would be 100001000 in binary where the 1 for 256 indicates a first name match, and the 1 for 8 indicates a DMF LASTZIP or LUMLPZIP match with the voter registration ZIP. A larger score isn't necessarily "better". Different scores show different types of matches.

LastVote: Iif(IsNull([Voter History 1]),Null,DateValue(Left([Voter History 1],10)))

VoteOK: Iif((([LastVote]>#1/1/1900#) And ([LastVote]<#11/2/2010#) And ([DEATHDATE]>#1/1/1900#),Iif([LastVote]<[DEATHDATE],"Problem","OK"))

Query: 3Make-Score-Matches → Score-Order Table

9466 rows

Add index to SSN, Voter ID (Duplicates OK)

Multiple dead match voter

170 duplicate SSNs, 367 rows marked by Score-Order-Mark-SSN-Duplicates

Resolve manually: Assign Code: Mismatch, Indeterminate, blank

Save Mismatches and Indeterminate in separate table (Save-Duplicate-SSNs) and delete from Score-Order table.

9466 - 343 = 9123 remaining

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Make SSN a "no duplicates" index to confirm.

79 duplicate VoterIDs, 162 rows marked

9123 - 142 = 8981

Make VoterID a "no duplicates" index to confirm

8981 records after resolving duplicate IDs.

6548 with VoteOK defined.

Combinations of Matching Scores (Query A5-Make-Score-Order-Counts):

FNAMEscore	MixNamescore	Suffixscore	ZIPscore	MNAMEscore	TotalScore	Raw Count
256	0	16	8	2	282	1
256	0	16	8	0	280	1
256	0	16	0	2	274	1
256	0	16	0	0	272	1
256	0	0	8	4	268	16
256	0	0	8	2	266	982
256	0	0	8	1	265	277
256	0	0	8	0	264	508
256	0	0	0	4	260	49
256	0	0	0	2	258	868
256	0	0	0	1	257	409
256	0	0	0	0	256	845
128	0	0	8	2	138	5
128	0	0	8	1	137	9
128	0	0	8	0	136	2
128	0	0	0	2	130	3
128	0	0	0	1	129	7
128	0	0	0	0	128	2
64	0	0	8	2	74	19
64	0	0	8	1	73	34
64	0	0	8	0	72	26
64	0	0	0	2	66	69
64	0	0	0	1	65	37
64	0	0	0	0	64	317
0	32	0	8	1	41	2
0	32	0	8	0	40	47
0	32	0	0	1	33	3
0	32	0	0	0	32	88
0	0	16	0	0	16	4
0	0	0	8	4	12	1
0	0	0	8	2	10	139
0	0	0	8	1	9	35
0	0	0	8	0	8	688
0	0	0	0	4	4	7
0	0	0	0	2	2	2,112
0	0	0	0	1	1	1,367
TOTAL						8,981

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Each category of scores was reviewed manually looking for mismatches.

TotalScore	Raw Count	Apparent Matches	Weak Match	Matches	Mismatch
282	1	1		1	
280	1	1		1	
274	1	1		1	
272	1		1	1	
268	16	16		16	
266	982	982		982	
265	277	277		277	
264	508	503	5	508	
260	49	49		49	
258	868	868		868	
257	409	409		409	
256	845	593	82	675	170
138	5	5		5	
137	9	9		9	
136	2	2		2	
130	3	3		3	
129	7	7		7	
128	2	1		1	1
74	19	19		19	
73	34	33		33	1
72	26	26		26	
66	69	69		69	
65	37	37		37	
64	317	5		5	312
41	2	2		2	
40	47	46		46	1
33	3	1		1	2
32	88	15		15	73
16	4	1		1	3
12	1	1		1	
10	139	94		94	45
9	35	18	2	20	15
8	688	90		90	598
4	7	1		1	6
2	2,112	9		9	2,103
1	1,367	10		10	1,357
TOTAL	8,981	4,204	90	4,294	4,687

Suggestions for next match:

- Fix residential Zips to be ZIP5 to improve ZIP matches.
- Remove periods from middle name initials in voter registration data

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- In category 264 allow difference in middle names for females (possibly maiden name mismatch), but not for males? Tag as "weak" match?
- In category 256, should have better score for "blank" middle name in one source vs. a mismatch.
- IN category 64, assume mismatch unless compelling match.

Query: 4Make-Score-Zero → Score-Zero Table

73,256 rows

As above, but TotalScore = 0

Look for data quality problems that may have resulted in zero score.

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Breakdown of Dead Registered Voters

County	Count
Adair	2
Andrew	13
Atchison	16
Audrain	7
Barry	2
Barton	5
Bates	8
Benton	1
Bollinger	10
Boone	113
Buchanan	6
Butler	90
Caldwell	1
Callaway	72
Camden	3
Cape Girardeau	3
Carter	1
Cass	48
Christian	12
Clark	1
Clay	74
Clinton	1
Cole	1
Cooper	3
Crawford	12
Dade	30
Dallas	1
Daviess	1
Dent	10
Douglas	8
Dunklin	11
Franklin	15
Gasconade	1
Gentry	2
Greene	139
Henry	4
Hickory	22
Howard	8
Howell	1
Iron	4

County	Count
Jackson	47
Jasper	5
Jefferson	17
Johnson	12
Kansas City	208
Laclede	1
Lafayette	4
Lawrence	3
Lewis	2
Lincoln	2
Linn	2
Livingston	1
Macon	1
Madison	2
Maries	7
Marion	39
McDonald	3
Mercer	1
Miller	10
Mississippi	32
Moniteau	2
Montgomery	2
Morgan	4
New Madrid	24
Newton	2
Nodaway	1
Oregon	10
Osage	1
Ozark	10
Pemiscot	12
Perry	5
Pettis	13
Phelps	5
Pike	2
Platte	10
Polk	1
Putnam	17
Ralls	6
Randolph	6
Ray	5
Reynolds	8
Ripley	4
Saline	52
Schuyler	15
Scotland	2
Scott	21
Shannon	1

County	Count
Shelby	2
St. Charles	35
St. Clair	2
St. Francois	19
St. Louis	2,292
St. Louis City	488
Ste. Genevieve	2
Stoddard	4
Stone	21
Sullivan	14
Taney	2
Texas	1
Vernon	1
Washington	2
Wayne	2
Webster	1
Worth	2
Wright	2
TOTAL	4,294

1797 or 42% of dead registered are inactive.