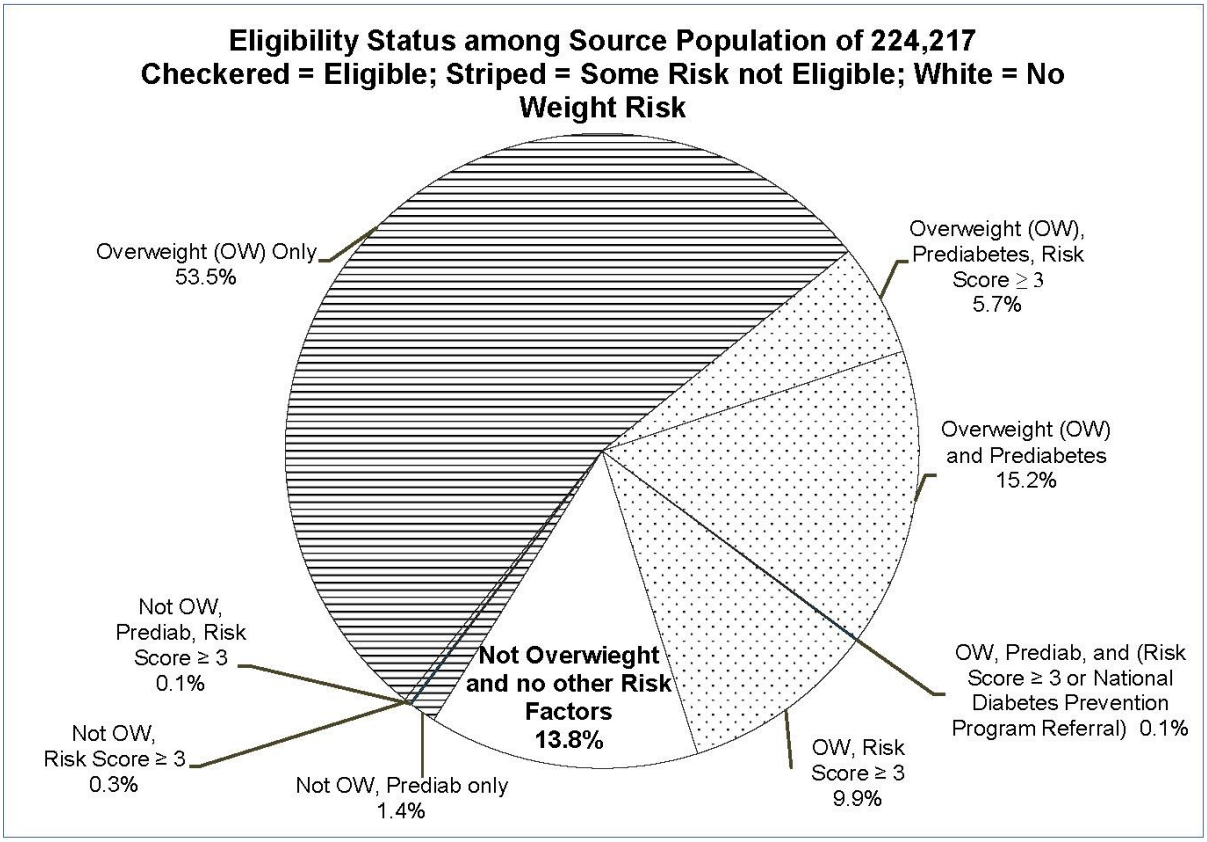
Appendix Figure 1. Distribution of how criteria was met for eligibility (n=69,434; 31%) and those not eligible (n=154,783: 69%).



Criteria for study inclusion (the dotted slices of the pie):

1) Overweight defined as BMI ≥25 kg/m^2 for non-Asian persons and BMI ≥23 kg/m^2 for Asian persons (or BMI ≥24 kg/m^2 for non-Asian persons and BMI ≥22 kg/m^2 for Asian persons if prior to March 2018, when guidelines were updated), **and**

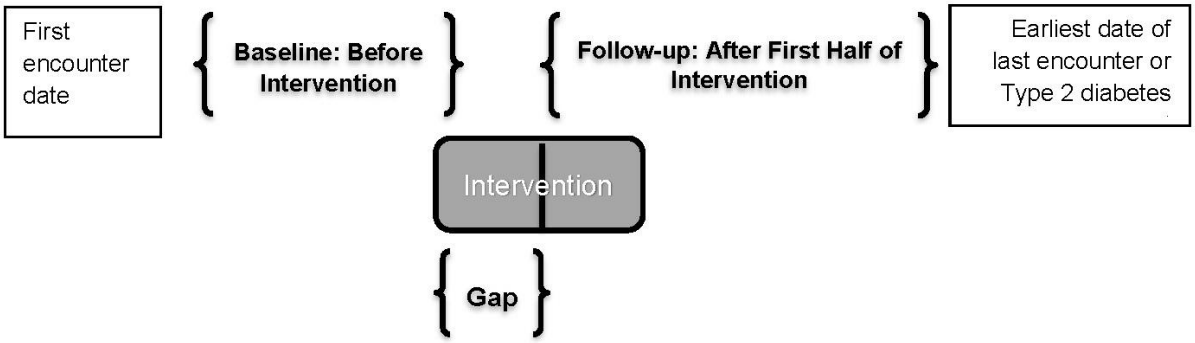
2) at least one of the following:

a. prediabetes (i.e., glycated hemoglobin 5.7%–6.4%, fasting plasma glucose 100–125 mg/dL, or a diagnosis code of prediabetes [ICD-9=790.2x or ICD-10=R73.03]),

b. previous gestational diabetes, or

c. ≥3 of the following risk factors (as a proxy for commonly-used prediabetes risk questionnaires): obesity (BMI ≥30 kg/m^2), high blood pressure, family history of type 2 diabetes, male sex, or age ≥50 years.

Appendix Figure 2. Timeframe for before and after intervention for HbA1c and BMI change analysis.



Appendix Table 1. Variable and Case Definitions

The Observational Medical Outcomes Partnership (OMOP) Common Data Model (CDM) v4 was used to standardize the disparate coding schemes present in EHRs, such as the ICD, National Drug Code, Current Procedural Terminology, and the Systematized Nomenclature of Medicine (SNOMED) Clinical Terms into a common vocabulary. The application of OMOP CDM terminologies, vocabularies, and coding schemes for the development of the LEADR allowed for the aggregation of disparate observational databases.

Variable	LEADR Definition
Type 2 diabetes	1) A diabetes diagnosis of type 2 diabetes or unspecified diabetes diagnosis made on 2 different days within 24 months (i.e., to identify a new diabetes case 2 separate diagnosis records of diabetes were required that were at least 14 days apart)*, or 2) A prescription for metformin or glucagon-like peptide-1 (GLP1) agonists and a Type2DM or unspecified diabetes diagnosis on any encounter (activities <14 days apart), or 3) A prescription for an antidiabetic agent (alpha-glucosidase inhibitors, amylin analogs, anti-diabetic agent combinations including those with metformin, insulin use among non-pregnant women, meglitinides, sodium glucose cotransporter 2 inhibitors, sulfonylureas, thiazolidinediones, dipeptidyl peptidase-4 inhibitors), or 4) Hemoglobin A1c ≥6.5%, or 5) Fasting plasma glucose >126 mg/dL, or 6) Random blood glucose >250 mg/dL or 7) Two random blood glucoses ≥200 mg/dL separated by ≥14 days * Mapped diagnosis codes to T2 or unspecified Diabetes OMOPs include: ICD-9 Codes for type 2 diabetes (T2DM) or unspecified Diabetes or T2DM diabetes complications: 250.x0, 250.x2, 362.01–362.07, 357.2, 366.41, 648.0x. ICD10 Codes for T2DM diabetes or complications: E11.x, O24.1x, O24.3x, O24.8x, O24.9x.
Obesity	BMI ≥30 kg/m^2
Prediabetes	1.) A prediabetes diagnosis (ICD-9=790.2X; ICD-10=R73.03), or 2.) Lab results: a) glycated hemoglobin (HbA1c) lab result ≥5.7% and <6.5% or b) fasting plasma glucose ≥100 mg/dL and <126mg/dL
Hypertension	1. Two hypertension diagnoses (≥14 days apart) 2. A hypertension diagnosis and a hypertension medication prescription a) angiotensin-converting enzyme inhibitors (ACE), b) angiotensin II receptor blockers (ARB), c) beta blockers,

	d) calcium channel blocks, and/or e) diuretics 3. A hypertension diagnosis and a) systolic blood pressure average >140 (if at least 2 results ≥14 days apart), or b) diastolic blood pressure average >90 (if at least 2 results ≥14 days apart)
Elevated lipids	1. An elevated lipids diagnosis, or 2. A prescription for elevated lipids medication: a) statins or statin combinations, b) fibrate, c) niacin, d) bile acid sequestrates, and/or e) other lipid-modifying agents, or 3. Lab results nearest the earliest record of prediabetes: a) triglyceride level ≥250 mg/dL, b) HDL <40 mg/dL for males and <50 mg/dL for females, c) non-HDL value ≥160 mg/dL.
Cardiovascular disease (CVD)	One or more of these diagnoses codes found: • Ischemic heart disease • Stroke • Peripheral vascular disease • Heart failure • Carotid artery disease • Other CVD diagnosis
Family history of diabetes	1. A diagnosis of family history of diabetes, or 2. A record in the Observation file denoting family history of diabetes

Appendix Table 2. Description of Social Vulnerability Index and Charlson-Deyo Combordity Index

Variable	Definition
Overall Social Vulnerability Index (SVI)	The SVI indicates the relative vulnerability of every U.S. Census tract. Census tracts are subdivisions of counties for which the Census collects statistical data. SVI ranks the tracts on 15 social factors, including unemployment, minority status, and disability, and further groups them into four related themes. Each tract receives a ranking for each Census variable and for each of the four themes, as well as an **overall ranking**. The SVI uses 15 US census variables to develop four themes: 1.) Socioeconomic Status, 2) Household Composition & Disability, 3) Minority Status & Language, and 4) Housing & Transportation. Each US Census tract is ranked from highest to lowest for each variable and each variable is grouped into 4 themes. A higher percentile rank represents greater vulnerability. 1.0 –most vulnerable, 0.0 least vulnerable. For example, if a census tract has a percentile rank of 0.8 for a variable, it is more vulnerable for that variable than 80% of all tracts against which it is ranked. More detail available at https://svi.cdc.gov/Documents/Data/2016_SVI_Data/SVI2016Documentation.pdf
Charlson-Deyo comorbidity index	The Charlson-Deyo comorbidity uses a weighted score of 17 comorbid conditions that have been shown to predict mortality. The higher the score, the more comorbidities. Conditions: 1. Chronic pulmonary disease 2. Diabetes without chronic complications***** 3. Malignancy not skin 4. Cerebrovascular disease 5. Congestive heart failure 6. HIV AIDS 7. Mild liver disease 8. Myocardial infarction 9. Renal disease 10. Paraplegia 11. Peripheral vascular disease 12. Mestatatic solid tumor 13. Dementia 14. Rheumatic disease 15. Peptic ulcer 16. Moderate sever liver dis 17. Diabetes with chronic complications***** * The index was run on dates between first encounter date and end of study date, which is the earliest of type 2 diabetes onset or last encounter date. Therefore,

	diabetes conditions were not found among our study sample of patients without type 2 diabetes. This index differs from the Charlson Comorbidity Index because it does not include functional status.

Appendix Table 3. Sub-Sample and Timeframe Statistics for the HbA1c and BMI Change Analysis

Characteristics	No intervention[a]	Metformin	LCP:[c] 1 session	LCP: 2–5 sessions	LCP: ≥6 sessions	Bariatric surgery	Metformin and LCP	Bariatric surgery and Metformin
Number of patients (full study sample)	63,283	2,681	1,482	950	543	250	203	42
HbA1c change analysis sub-sample and timeframes								
Number of consistent patients for HbA1c analysis[b]	8,144	719	567	428	287	99	103	27
% of full study sample	13%	27%	38%	45%	53%	40%	51%	64%
Months in baseline	26.3	41.4	49.2	51.9	62.2	56.8	45.0	55.0
Months intervention first half	26.3	9.4	0.0	1.1	2.3	1.5	16.4	11.7
Months in follow-up	26.3	27.4	42.8	40.1	36.7	29.4	29.8	27.6
Total study months (baseline start through follow-up end)	78.9	78.2	92.0	93.1	101.2	87.7	91.2	94.3
LCP number of sessions (if applicable) / Median	–	–	1	3	8	0	2	0
Intervention duration in months / median	–	12.1	0	1.4	2.8	0	32.1	18.1
Number of encounters in the data	45.5	53.5	85.3	60.0	59.4	63.7	64.5	71.8
BMI change analysis sub-sample and timeframes								
Number of consistent patients for BMI analysis[b]	50,530	1,878	1,335	897	530	240	176	41
% of full sample	80%	70%	90%	94%	98%	96%	87%	98%
Months in baseline	24.0	38.4	44.6	48.3	63.8	51.7	43.4	47.4
Months intervention first half	24.0	7.5	0.0	1.2	2.7	1.5	15.9	14.1
Months in follow-up	24.0	20.4	40.6	36.5	30.1	29.5	27.6	28.9
Total study months (baseline start through follow-up end)	72.0	66.3	85.2	86.0	96.6	82.7	86.9	90.4
LCP number of sessions (if applicable) / median	–	–	1	3	8	4	1	4
Intervention duration in months / median	–	10.9	0	1.6	3	0	30.1	23.2
Number of encounters in the data	39.3	47.0	85.3	56.5	57.6	56.3	59.5	70.0

[a]For the No Intervention group, Baseline is a person's first one-third days and Follow-up is the last one-third days in the study.
[b]Patient had at least 1 value before and after intervention.

LCP, lifestyle change program.

Appendix Table 4. LCP Utilization and Type 2 Diabetes (T2DM) Incidence Among Patients Who Were Referred to the National Diabetes Prevention Program

Use group	Patients, N	T2DM incidence	Mean months at risk*	Used Metformin	Bariatric surgery	LCP duration in months (Min, Max)
ALL	4,753	12.9%	35.2	2.0%	0.5%	0.7 (0–42.1)
10+ Sessions**	129	5.4%	26.2	6.2%	2.3%	12.3 (2.3–42.1)
9 Sessions	109	11.0%	30.8	5.5%	0.9%	3.2 (1.7–13.6)
8 Sessions	112	7.1%	35.5	5.4%	1.8%	2.9 (1.4–15.7)
7 Sessions	97	7.2%	34.2	4.1%	1.0%	3.2 (1.6–13.9)
6 Sessions	95	2.1%	37.2	5.3%	3.2%	3.1 (1.2–12.6)
5 Sessions	75	8.0%	33.6	2.7%	2.7%	2.4 (0.9–12.0)
4 Sessions	89	10.1%	37.0	6.7%	6.7%	2.5 (0.6–11.1)
3 Sessions	106	15.1%	38.0	7.5%	1.9%	1.5 (0.2–11.5)
2 Sessions	153	15.0%	37.0	11.8%	2.0%	0.8 (0.1–6.7)
1 Session	371	11.6%	42.3	8.6%	0.8%	0
Total attendees	1,336	10.0%	36.5	7.1%	1.9%	2.7 (0–42.1)
0 Sessions	3,417	14.0%	34.8	4.5%	0.0%	0

*Months at risk for T2DM incidence is defined as intervention start date through study end (Follow-up). For the group with 0 Sessions, the intervention start date is the middle of a patient's time in the study.
**For the 10+ Session group, the median = 19 Sessions and the mean = 28 Sessions.

LCP, lifestyle change program.