



# TEACHERS' RETIREMENT SYSTEM

## of the State of Kentucky

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**GARY L. HARBIN, CPA**  
Executive Secretary

### Quarterly Meeting of the Board of Trustees

### A G E N D A

March 18, 2019, 12:30 p.m.

Board Called to Order  
Roll Call

#### 1. Reports for Consent

##### 1.1. Consideration/Approval of Minutes

- 1.1.1. Quarterly Meeting of the Board of Trustees, December 17, 2018
- 1.1.2. Special Meeting of the Scholarship Committee, December 17, 2018
- 1.1.3. Special Meeting of the Legislative Committee, December 17, 2018
- 1.1.4. Special Meeting of the Administrative Appeals Committee,  
December 17, 2018

##### 1.2. Applications for Retirement and Annuity

##### 1.3. Survivor Benefits

##### 1.4. Life Insurance Benefits

##### 1.5. Refunds

##### 1.6. Interim Financial Statements

#### 2. Report of the Investment Committee

#### 3. Legislative Report

#### 4. Executive Secretary's Observations and Comments

General Discussion

Adjournment

The meeting will take place in the boardroom at the office of the  
Teachers' Retirement System of the State of Kentucky  
479 Versailles Road, Frankfort, Kentucky.

TO: Board of Trustees of the  
Teachers' Retirement System of Kentucky

FROM: Gary L. Harbin, CPA  
Executive Secretary

DATE: March 18, 2019

SUBJECT: Reports for Consent

1.1. Consideration/Approval of Minutes

- 1.1.1. Regular Quarterly Meeting of the Board of Trustees, December 17, 2018
- 1.1.2. Special Meeting of the Scholarship Committee, December 17, 2018
- 1.1.3. Special Meeting of the Legislative Committee, December 17, 2018
- 1.1.4. Special Meeting of the Administrative Appeals Committee, December 17, 2018

1.2. Applications for Retirement and Annuity

The lists of members who retired in December 2018, January and February 2019 will be available for examination at the meeting. Attached is a summary of the particular payments and a comparison to the same period last year. Initial retirements for the period included 322 retirees with monthly payments totaling \$868,938.06.

Recommendation: The board is requested to approve the initial payments listed in the report.

During the same period last year, there were 343 retirements with monthly payments totaling \$952,091.85.

1.3. Survivor Benefits

The list of persons qualifying for survivor benefit payments for the quarter October 1, 2018, through December 31, 2018, will be available for examination at the meeting. During the period, there were 5 survivor benefits with a total monthly payment of \$1,987.30.

Recommendation: The board is requested to approve the survivor benefit payments for the period October 1, 2018, through December 31, 2018, as listed in the report.

1.4. Life Insurance Benefits

The list of payments of life insurance benefits due to death of active and retired teachers for the period October 1, 2018, through December 31, 2018, will be available for examination at the meeting. There were 5 payments to the estates or beneficiaries of active teachers and 214 payments to the estates or beneficiaries of retired teachers for total payments of 1,080,000.

Recommendation: The board is requested to approve the payment of life insurance benefits as listed in the report.

During the same quarter in 2017, there were 214 payments in the amount of \$1,058,000.

### 1.5. Refunds

The report of refunds for the quarter ended December 31, 2018, is attached. There were 819 refunds for the quarter October 1, 2018, through December 31, 2018, and the amount refunded was \$7,259,975.44. The refunds are for the following categories:

Regular withdrawals	790	\$6,776,867.17
Deaths	<u>29</u>	<u>\$ 483,108.27</u>
Totals	819	\$7,259,975.44

Recommendation: The board is requested to approve the payment of refunds as listed in the report.

During the same quarter in 2017 there were 1,045 refunds totaling \$8,923,083.54

### 1.6. Interim Financial Statements

Attached are the Interim Financial Statements for the quarter ended December 31, 2018.

Recommendation: The Interim Financial Statements are provided for informational purposes only and require no action by the board.

***Teachers' Retirement System of Kentucky***  
**Initial Applications for Retirement and Annuity**  
**2018-2019**

	<b>December</b>	<b>January</b>	<b>February</b>	<b>Total</b>	<b>Same Period 2018</b>
<b>Handicapped Child</b>	<i>0</i> \$0.00	<i>0</i> \$0.00	<i>0</i> \$0.00	<i>0</i> \$0.00	<i>0</i> \$0.00
<b>Disability Retirement</b>	<i>7</i> \$18,757.47	<i>9</i> \$24,517.68	<i>16</i> \$40,997.35	<i>32</i> \$84,272.50	<i>23</i> \$66,254.23
<b>Service Retirement</b>	<i>61</i> \$167,662.16	<i>162</i> \$448,983.94	<i>66</i> \$167,177.13	<i>289</i> \$783,823.23	<i>319</i> \$883,631.28
<b>Beneficiary of Member Eligible to Retire</b>	<i>0</i> \$0.00	<i>0</i> \$0.00	<i>1</i> \$842.33	<i>1</i> \$842.33	<i>1</i> \$2,206.34
<b>TOTALS</b>	<i>68</i> \$186,419.63	<i>171</i> \$473,501.62	<i>83</i> \$209,016.81	<i>322</i> \$868,938.06	<i>343</i> \$952,091.85

**Reports for Consent**  
**Member Account Refunds**  
**For the period October 2018 - December 2018**

Active Refunds	Count	Net Refund	Taxes Withheld	Rollovers	Total
October	175	1,182,533.38	290,256.00	932,366.01	2,405,155.39
November	314	1,330,133.85	331,951.95	898,217.97	2,560,303.77
December	301	874,578.70	218,359.79	718,469.52	1,811,408.01
Total	790				6,776,867.17

Deceased Refunds	Count	Net Refund	Taxes Withheld	Rollovers	Total
October	14	174,267.96	14,217.10	61,736.85	250,221.91
November	7	17,788.87	4,447.22	9,231.96	31,468.05
December	9	103,293.25	3,314.87	94,810.19	201,418.31
Total	29				483,108.27

Total Refunds	Count	Net Refund	Taxes Withheld	Rollovers	Total
October	189	1,356,801.34	304,473.10	994,102.86	2,655,377.30
November	321	1,347,922.72	336,399.17	907,449.93	2,591,771.82
December	310	977,871.95	221,674.66	813,279.71	2,012,826.32
Total	819				7,259,975.44

# **TEACHERS' RETIREMENT SYSTEM**

**OF THE STATE OF KENTUCKY**



***INTERIM FINANCIAL STATEMENTS***

**QUARTER ENDED DECEMBER 31, 2018**

**(MARKET VALUE - UNAUDITED)**

**Statements of Plan Net Assets**  
**as of December 31, 2018 and 2017**  
( Market Value - Unaudited )

	Defined Benefit Plan		Health Insurance Plans		Life Insurance Plan		Other Funds		TOTAL	
	FY 2019	FY 2018	FY 2019	FY 2018	FY 2019	FY 2018	FY 2019	FY 2018	FY 2019	FY 2018
<b>ASSETS</b>										
Cash	\$ 116,415,748	\$ 94,692,943	\$ 36,107,012	\$ 32,998,774	\$ 220,355	\$ 147,887	\$ 87,061	\$ 105,340	\$ 152,830,176	\$ 127,944,944
Receivables										
Contributions	30,237,329	28,779,827	18,012,814	18,456,779	13,374	105,264			48,263,517	47,341,870
State of Kentucky	6,573,046	13,640,427	10,277,791	5,580,025	35,965	32,617			16,886,802	19,253,069
Investment Income	44,151,888	40,623,372	2,061,568	1,685,597	732,657	1,036,228	3,043	2,693	46,949,156	43,347,890
Investment Sales Receivable	4,358,358	6,018,955	674,832	448,087	180	-			5,033,370	6,467,042
Installment Account Receivable	282,711	321,073							282,711	321,073
Other Receivables	20,189	81,058	25,249,342	18,050,797					25,269,531	18,131,855
Due from Other Funds	1,779,623	1,567,471							1,779,623	1,567,471
<b>Total Receivables</b>	<b>87,403,144</b>	<b>91,032,183</b>	<b>56,276,347</b>	<b>44,221,285</b>	<b>782,176</b>	<b>1,174,109</b>	<b>3,043</b>	<b>2,693</b>	<b>144,464,710</b>	<b>136,430,270</b>
Investments at Market Value										
Short Term Investments	446,108,561	585,367,056	42,385,152	52,455,104	3,987,055	3,401,233	371,469	401,217	492,852,237	641,624,610
Bonds and Mortgages	2,980,348,426	2,838,667,624	100,220,141	85,874,745	30,901,430	82,053,948	248,946	259,938	3,111,718,943	3,006,856,255
Stocks	10,777,210,819	12,573,899,120	600,121,020	565,977,822	41,614,549		286,543	308,924	11,419,232,931	13,140,185,866
Alternative Investments	1,369,268,640	1,257,306,697	97,847,485	69,498,398					1,467,116,125	1,326,805,095
Real Estate	1,191,999,695	1,102,298,830	69,921,922	55,426,213	874,222				1,262,795,839	1,157,725,043
Additional Categories	1,359,125,009	1,416,326,994	186,853,983	173,324,520	1,332,100				1,547,311,092	1,589,651,514
<b>Total Investments</b>	<b>18,124,061,150</b>	<b>19,773,866,321</b>	<b>1,097,349,703</b>	<b>1,002,556,802</b>	<b>78,709,356</b>	<b>85,455,181</b>	<b>906,958</b>	<b>970,079</b>	<b>19,301,027,167</b>	<b>20,862,848,383</b>
Capital Assets	16,324,647	18,046,639							16,324,647	18,046,639
( net of accumulated depreciation )										
<b>Total Assets</b>	<b>18,344,204,689</b>	<b>19,977,638,086</b>	<b>1,189,733,062</b>	<b>1,079,776,861</b>	<b>79,711,887</b>	<b>86,777,177</b>	<b>997,062</b>	<b>1,078,112</b>	<b>19,614,646,700</b>	<b>21,145,270,236</b>
<b>LIABILITIES</b>										
Liabilities										
Accounts Payable	1,189,081	-	-	-					1,189,081	-
Contributions Not Posted	46,629,538	38,872,841		-					46,629,538	38,872,841
Investment Purchases Payable	11,111,381	8,655,779	1,762,055	1,390,354	4,957		-	-	12,878,393	10,046,133
Investment Fees Payable	14,103,336	15,983,153	1,046,539	796,350	7,605		-	-	15,157,480	16,779,503
Due to Other Funds	-	-	1,747,561	1,538,573	30,979	27,690	1,083	1,208	1,779,623	1,567,471
Revenues Collected in Advance	-	-	1,749,168	3,437,483					1,749,168	3,437,483
<b>Total Liabilities</b>	<b>73,033,336</b>	<b>63,511,773</b>	<b>6,305,323</b>	<b>7,162,760</b>	<b>43,541</b>	<b>27,690</b>	<b>1,083</b>	<b>1,208</b>	<b>79,383,283</b>	<b>70,703,431</b>
<b>NET ASSETS HELD IN TRUST FOR PENSION BENEFITS</b>										
	<u>\$ 18,271,171,353</u>	<u>\$ 19,914,126,313</u>	<u>\$ 1,183,427,739</u>	<u>\$ 1,072,614,101</u>	<u>\$ 79,668,346</u>	<u>\$ 86,749,487</u>	<u>\$ 995,979</u>	<u>\$ 1,076,904</u>	<u>\$ 19,535,263,417</u>	<u>\$ 21,074,566,805</u>

**Statements of Changes in Plan Net Assets**  
**For the Six Months Ended December 31, 2018 and 2017**  
( Market Value - Unaudited )

	Defined Benefit Plan		Medical Insurance Plan		Life Insurance Plan		Other Funds		TOTAL	
	FY 2019	FY 2018	FY 2019	FY 2018	FY 2019	FY 2018	FY 2019	FY 2018	FY 2019	FY 2018
<b>ADDITIONS</b>										
<b>Contributions</b>										
Employer- State Paid	\$ 483,593,931	\$ 447,383,590	\$ 38,593,656	\$ 35,960,870	\$ 451,397	\$ 359,410	\$ -	\$ -	\$ 522,638,984	\$ 483,703,870
Employer- LSD, Other	33,886,636	36,631,266	44,575,963	42,787,442	92,484	73,276	-	162,975	78,555,083	79,654,959
Member- Active	134,872,932	129,093,620	54,759,438	52,459,759					189,632,370	181,553,379
Member- Retired			29,563,138	29,170,320					29,563,138	29,170,320
Recovery Income			37,933,920	45,239,731					37,933,920	45,239,731
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Total Contribution	652,353,499	613,108,476	205,426,115	205,618,122	543,881	432,686	-	162,975	858,323,495	819,322,259
<b>Investment Income/(Loss)</b>										
Net Appreciation/(Depreciation) in										
Fair Value of Investments	(1,554,571,127)	1,388,976,811	(55,503,684)	63,342,156	(4,211,085)	(381,286)	(24,438)	29,797	(1,614,310,334)	1,451,967,478
Interest	80,867,432	72,020,190	3,187,261	2,496,059	827,790	1,368,713	12,032	6,317	84,894,515	75,891,279
Dividends	197,165,139	164,939,396	3,199,936	2,703,692	309,763		2,904	2,842	200,677,742	167,645,930
Rental Income, Net	14,134,700	15,062,675							14,134,700	15,062,675
Securities Lending, Net	1,502,520	2,002,481			11,627	1,075	248	158	1,514,395	2,003,714
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Gross Investment Income	(1,260,901,336)	1,643,001,553	(49,116,487)	68,541,907	(3,061,905)	988,502	(9,254)	39,114	(1,313,088,982)	1,712,571,076
Less Investment Expense	(30,311,606)	(26,043,387)	(2,522,958)	(1,528,599)	(70,886)	-	(8,173)	-	(32,913,623)	(27,571,986)
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Net Investment Income	(1,291,212,942)	1,616,958,166	(51,639,445)	67,013,308	(3,132,791)	988,502	(17,427)	39,114	(1,346,002,605)	1,684,999,090
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Total Additions	(638,859,443)	2,230,066,642	153,786,670	272,631,430	(2,588,910)	1,421,188	(17,427)	202,089	(487,679,110)	2,504,321,349
<b>DEDUCTIONS</b>										
Benefits	1,046,559,653	1,000,458,660			2,205,000	2,449,106	108,912	87,681	1,048,873,565	1,002,995,447
Refunds of Contributions	19,789,877	18,442,280							19,789,877	18,442,280
Under 65 Insurance Expenses			58,162,858	59,282,507					58,162,858	59,282,507
Over 65 Insurance Expenses			102,476,881	99,124,495					102,476,881	99,124,495
Administrative Expense	5,252,770	4,738,414	-	-	-	-	-	-	5,252,770	4,738,414
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Total Deductions	1,071,602,300	1,023,639,354	160,639,739	158,407,002	2,205,000	2,449,106	108,912	87,681	1,234,555,951	1,184,583,143
Net Increase ( Decrease )	(1,710,461,743)	1,206,427,288	(6,853,069)	114,224,428	(4,793,910)	(1,027,918)	(126,339)	114,408	(1,722,235,061)	1,319,738,206
<b>NET ASSETS HELD IN TRUST</b>										
<b>FOR PENSION BENEFITS</b>										
Beginning of year	19,981,633,096	18,707,699,025	1,190,280,808	958,389,673	84,462,256	87,777,405	1,122,318	962,496	21,257,498,478	19,754,828,599
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Ending of period	\$ 18,271,171,353	\$ 19,914,126,313	\$ 1,183,427,739	\$ 1,072,614,101	\$ 79,668,346	\$ 86,749,487	\$ 995,979	\$ 1,076,904	\$ 19,535,263,417	\$ 21,074,566,805
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TO: Board of Trustees of the  
Teachers' Retirement System of the State of Kentucky

FROM: Gary L. Harbin, CPA  
Executive Secretary

DATE: March 18, 2019

SUBJECT: Report of the Investment Committee

1. Investment Committee Meeting and Actions: The investments approved at the February 14, 2019, Investment Committee meeting are as follows: Up to \$85 million from the TRS Retirement Annuity, up to \$15 million from the TRS Medical Trust and up to \$1 million from the TRS Life Insurance account into Rockwood Capital Real Estate Partners Fund XI LP. Additionally, outside managers Barings Asset Management and Todd Asset Management reported to the committee on their respective portfolios.

2. Purchases and Disposals: The Report of the Investment Committee for the quarter ended December 31, 2018, is presented for review and approval. During this quarter, 2,884 purchases amounted to \$3,211,714,641.78 and 2,254 disposals amounted to \$3,108,295,362.05. The disposals consisted of 1,909 sales, 316 principal payments and 29 redemptions. While TRS initiates each of these transactions, the custodian of securities is responsible for handling and securing each stock, bond or other type of investment. At the end of the quarter, TRS's invested securities had a book value of \$15,439,289,044.86 and a market value of \$18,145,276,505.19.

3. Staff's Comments on Economic and Market Conditions: The fourth quarter of calendar 2018 was characterized by a heightened level of volatility and negative returns for most risk assets. Though equity markets experienced an initial decline in October, the strongest risk-off environment emerged in December as global growth forecasts, inflation expectations and corporate earnings expectations began to roll over in unison. With this as a backdrop, market participants repriced global equities and moderated expectations for corporate earnings growth in 2019. On the other side of the spectrum, duration-sensitive assets and government bonds performed well during the December flight to safety, while high-yield credit and loan markets posted losses. Emerging market equities outperformed developed equity markets during the quarter, but still trailed their developed counterparts for the full year.

In a move that proved to be more controversial than many anticipated, the Federal Reserve Open Market Committee (FOMC) raised the target range for the federal funds rate by 0.25 percent for the fourth time in 2018 during its December meeting, resulting in a target range of 2.25 percent to 2.5 percent. Economic data in the United States remained strong, with non-farm payrolls up 312,000 in December on a 3.9 percent unemployment rate. However, with market attention focused on data indicating a potential Chinese economic slowdown, Chairman Jerome Powell's reference to the Federal Reserve's balance sheet normalization process being on "autopilot" generated further volatility in security pricing, particularly for equities. The turmoil in equity markets and uncertainty with respect to 2019 global growth has pushed market implied

expectations for another rate increase at the FOMC March meeting down to zero according to data provided by Chicago Mercantile Exchange (CME).

Amid broadening macroeconomic concerns, U.S. equity markets faltered during the fourth quarter as the S&P 500 Index posted returns of minus 13.5 percent, ranking within the top 15 largest quarterly drawdowns for the index since 1970. Despite a year-to-date return of 10.6 percent through September, fourth quarter losses drove total S&P 500 Index returns to minus 4.4 percent for the year, marking the first negative calendar-year result for the index since 2008.

The surge in volatility was met with a shift in investor preference from momentum-oriented stocks to bond-proxy and defensive segments. As a result, utilities, real estate and consumer staples bested all other sectors in the index, marking a notable reversal from the previous leadership from the technology, consumer discretionary, and health care sectors in the first nine months of the year. Consequently, low volatility and dividend-based factor indices outperformed their growth, high beta and momentum factor counterparts. Outside of this broad trend, the quarter's marked decline in oil prices led to sharp losses in energy as the S&P 500 Energy Index returned minus 23.8 percent, the largest loss across all sectors.

Active management results were mixed during the quarter. Value managers across styles and market capitalizations generally struggled due to persistent underweights in defensive, income-oriented sectors. Meanwhile, growth managers performed moderately better during the quarter, buoyed by exposure to companies with strong secular earnings and revenue growth as many experienced more muted declines than the broader market.

Developed international equity markets outperformed the U.S. equity market, but still ended the fourth quarter with negative double-digit returns. The international equity sell-off partially was induced by volatility in the U.S. market, but also driven by international economic tensions. For instance, Brexit-driven uncertainty continued to influence stock prices as did rioting in France in response to President Emmanuel Macron's fiscal agenda. Economic concerns also continued to rise in Europe due to a sharp decline in new manufacturing export orders and third quarter gross domestic product growth of only 0.2 percent, the slowest pace seen in years.

The emerging markets were the best performing region for equities in the fourth quarter, but still finished the quarter and year in negative territory. Overall emerging-markets investor sentiment weakened due to continued fears of growth moderation in China. These fears were reflected in recent economic data as well. For example, in China, year-over-year imports and exports declined 8 percent and 4 percent in December, respectively, compared to 37 percent and 11 percent growth, respectively, at the beginning of 2018. Thus far, China is responding to the recent slowdown by stimulating the economy through both monetary and fiscal measures; however investor sentiment remains mixed.

The Bloomberg U.S. Aggregate Index recouped losses from earlier in the year, returning 1.6 percent during the fourth quarter to end the year roughly flat. The yield spread between two-year and 10-year maturities, a popular range often cited as a recession indicator, narrowed to just 0.21 percent, the lowest quarter-end value since the second quarter of 2007.

Credit spreads widened over the quarter, as investors sought the safety of Treasuries amid elevated market volatility. Securities rated below investment grade were hit particularly hard in the fourth quarter, with the Bloomberg U.S. High Yield Index returning minus 4.5 percent after an otherwise positive year. While the highest-rated corporate bonds finished the quarter in positive territory, the negative returns of the large BBB-rated segment were an overall drag on the Bloomberg U.S. Corporate Investment Grade Index, which had a quarterly return of minus 0.2 percent.

Core private real estate returned a preliminary 1.8 percent during the fourth quarter, as tracked by the NCREIF-ODCE Index, with the total return comprised of 1 percent income and 0.7 percent price appreciation. This represented a 31-basis-point downtick over the prior quarter for the appreciation component of total return. While the income return component was lower, it remains in line with historical levels. Investors in publicly traded real estate significantly underperformed their private market counterparts during the fourth quarter. In 2018, the commercial real estate market experienced moderating year-over-year transaction volume. However, many view the moderation in transaction volume as a healthy signal that the overall market is operating in an efficient manner. During the quarter, investors in private real estate took notice of the public market volatility and continue to evaluate the signals from the Federal Reserve. During the fourth quarter, the U.S. 10-year Treasury crept above 3 percent, raising investor concerns about the potential impact on property valuations and future returns. By the end of the quarter, however, it ended near 2.7 percent, relieving some concerns about the potential negative impacts from increased borrowing costs and direction of capitalization rates.

4. Performance: Investment performance was negative for the quarter ended December 31, 2018. The Retirement Annuity Trust Fund's portfolio declined 9.18 percent for the quarter, underperforming the Policy Index which declined 8.35 percent. TRS's domestic equities declined 15.63 percent, as the S&P 1500 Stock Index declined 13.97 percent for the quarter. TRS's international stocks returned minus 15.53 percent, underperforming the MSCI All Country ex U.S. index which had a return of minus 11.41 percent for the quarter. Alternatives and real estate were positive contributors as private equity gained 4.29 percent while real estate returned 2.46 percent. TRS's fixed income returned 1.65 percent, outperforming the Bloomberg Barclays Gov/Credit Bond Index which returned 1.46 percent for the quarter.

**Recommendation:** The executive secretary recommends that the board accept and ratify the Report of the Investment Committee.

*Teachers' Retirement System of the State of Kentucky*  
*Retirement Annuity Trust*  
*Quarterly Investment Performance*  
*Gross Returns*  
*For the Period Ended December 31, 2018*

FINAL

	<u>Market Value</u>	<u>Last Qtr</u>	<u>FYTD</u>	<u>1-Year</u>	<u>3-Year*</u>	<u>5-Year*</u>	<u>10-Year*</u>	<u>20-Year*</u>
<b>TOTAL PLAN</b>	\$ 18,145,273,505.19	-9.18	-6.46	-4.78	6.65	5.62	9.42	5.64
<i>Policy Benchmark</i>		-8.35	-4.91	-4.17	7.15	5.65	9.15	-
<b><u>Total Equity</u></b>	\$ 10,907,446,056.91	-15.60	-12.36	-10.59	6.72	5.50	11.50	5.22
<b><u>Domestic Equity</u></b>	\$ 7,114,451,020.63	-15.63	-10.55	-7.70	7.85	7.42	13.03	5.97
<i>S&amp;P 1500 Index</i>		-13.97	-7.65	-4.96	9.17	8.25	13.20	-
<b><u>All-Cap Equities</u></b>	\$ 289,425,748.72	-12.89	-7.43	-4.69	-	-	-	-
<i>Russell 3000</i>		-14.30	-8.20	-5.24	-	-	-	-
<b><u>Large-Cap Equities</u></b>	\$ 5,891,790,194.12	-15.25	-9.88	-7.48	7.79	7.55	12.87	-
<i>S&amp;P 500 Index</i>		-13.52	-6.85	-4.38	9.26	8.49	13.12	-
<b><u>Mid-Cap Equities</u></b>	\$ 571,056,881.98	-17.30	-13.70	-8.91	8.74	7.28	13.98	-
<i>S&amp;P 400 Index</i>		-17.28	-14.08	-11.08	7.66	6.03	13.68	-
<b><u>Small-Cap Equities</u></b>	\$ 362,178,195.81	-20.45	-17.28	-11.00	7.94	5.95	13.90	-
<i>S&amp;P 600 Index</i>		-20.10	-16.34	-8.48	9.46	6.34	13.61	-
<b><u>International Equity</u></b>	\$ 3,792,995,036.28	-15.53	-15.51	-15.52	4.60	1.33	8.00	-
<i>MSCI AC World Ex US</i>		-11.41	-10.70	-13.78	4.98	1.14	7.06	-
<b><u>Fixed Income</u></b>	\$ 3,039,369,585.59	1.65	1.71	0.28	2.66	2.98	4.54	5.12
<i>Barclay's Govt./Credit Index</i>		1.46	1.51	-0.42	2.19	2.53	3.46	4.56
<b><u>Real Estate</u></b>								
<b><u>In House Real Estate Equity</u></b>	\$ 424,559,554.26	2.44	4.40	10.66	11.08	10.03	8.90	9.05
<i>CPI plus 2%</i>		0.79	1.75	3.98	4.09	3.52	3.84	4.17
<b><u>Core Real Estate:</u></b>	\$ 446,876,887.18	2.24	4.66	8.98	8.79	11.08	4.70	-
<i>NCREIF ODCE (VW)</i>		1.76	3.88	8.35	8.24	10.41	7.00	-
<b><u>Non-Core Real Estate:</u></b>	\$ 320,563,253.37	2.81	5.64	11.05	13.25	15.93	-	-
<i>NCREIF Property Index</i>		1.37	3.07	6.72	7.21	9.33	-	-
<b><u>Alternative Investments</u></b>								
<b><u>Private Equity</u></b>	\$ 1,187,639,090.02	4.29	8.81	16.42	13.76	13.53	12.27	-
<b><u>Mature Private Equity</u></b>	\$ 402,600,795.23	4.58	9.95	15.94	10.87	12.20	-	-
<i>S&amp;P 500 plus 3%</i>		-12.88	-5.46	-1.52	12.53	11.75	-	-
<b><u>Private Equity &lt; 5 Years</u></b>	\$ 785,038,294.79	3.85	7.96	16.60	16.48	14.49	-	-
<b><u>Timberland:</u></b>	\$ 181,629,549.70	0.39	1.61	-5.76	1.06	4.57	3.43	-
<i>NCREIF Timberland Index</i>		0.97	2.00	3.44	3.22	4.98	3.83	-
<b><u>Additional Categories:</u></b>	\$ 1,374,568,294.59	-1.57	0.97	2.86	6.05	4.00	-	-
<i>B of A Merrill Lynch High Yield Master II</i>		-4.67	-2.34	-2.27	7.27	3.82	-	-
<b><u>Cash (Unallocated)</u></b>	\$ 262,621,233.57	0.54	1.07	1.97	1.09	0.69	0.44	2.06
<i>90 Day T-Bill</i>		0.56	1.06	1.87	0.99	0.61	0.35	1.80

**Total Plan Gross Return for 30-year period\* 8.04**

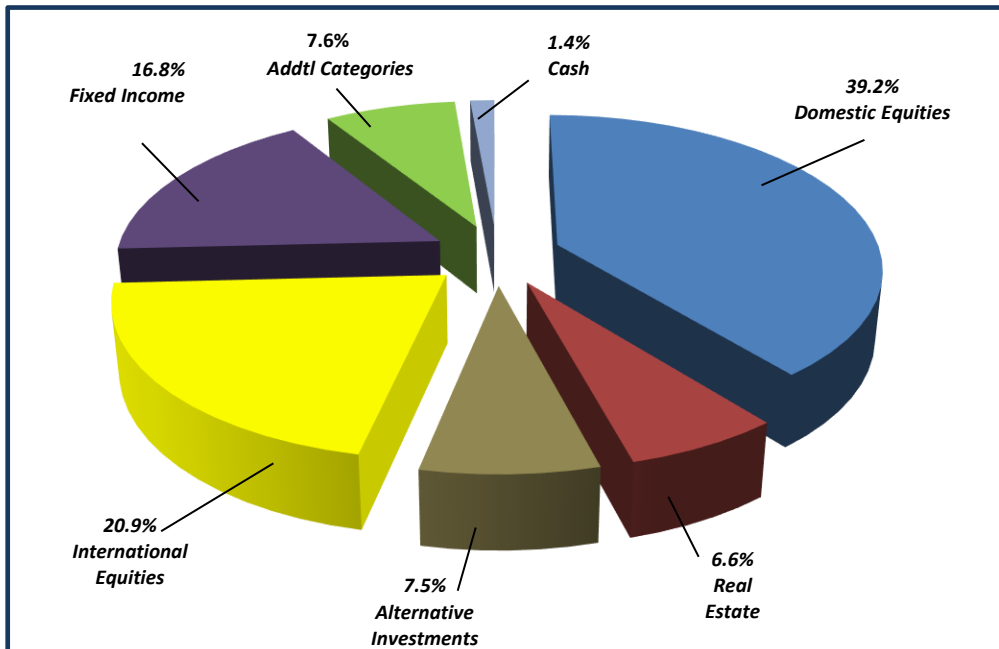
\*Returns are annualized for periods longer than one year

\*\* Prior to July 1, 2008, TRS did not benchmark overall fund performance. Effective July 1, 2008, the Board of Trustees approved a Policy Index that represents the returns of appropriate benchmarks for the various asset classes weighted by the mid-point of the strategic range for the current fiscal year.

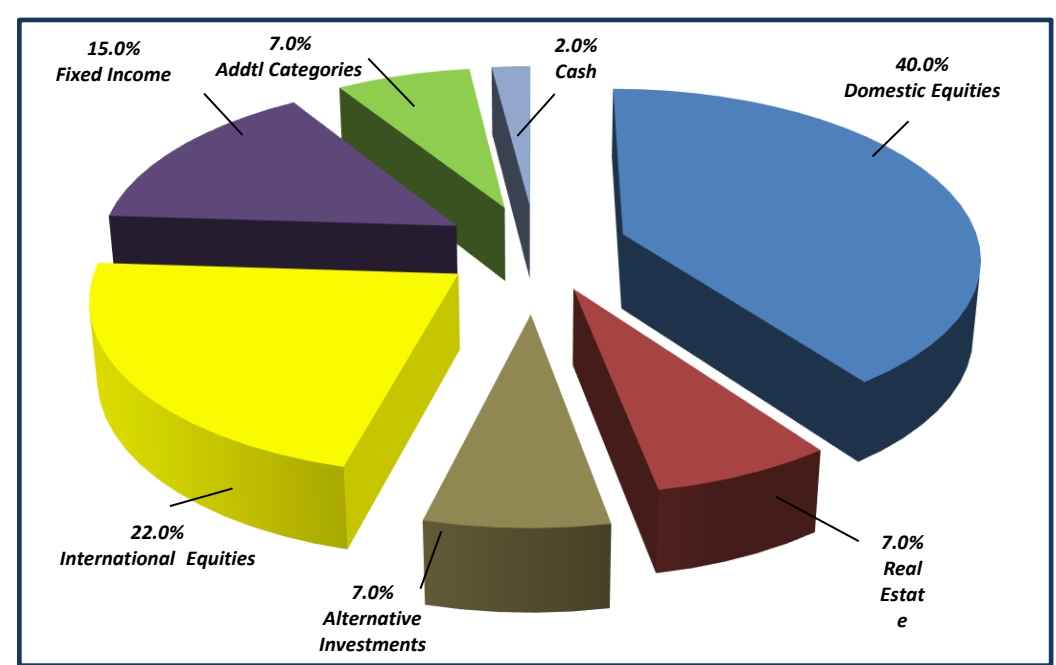
**Teachers' Retirement System of Kentucky**  
Quarterly Investment Update  
For the period ended December 31, 2018

(\$ in millions)	\$'s	12/31/2018 Actual %	9/30/2018 Actual %	Target %	Strategic Ranges
Domestic Equities	\$7,114.4	39.2%	39.8%	40.0%	34.0 - 48.0%
Real Estate	1,192.0	6.6%	5.8%	7.0%	4.0 - 10.0%
Alternative Inv.	1,369.3	7.5%	6.6%	7.0%	4.0 - 10.0%
International Equities	3,793.0	20.9%	22.3%	22.0%	18.0 - 25.0%
Fixed Income	3,039.4	16.8%	17.4%	15.0%	12.0 - 19.0%
Addtl Categories	1,374.6	7.6%	7.0%	7.0%	4.0 - 10.0%
Cash	\$262.6	1.4%	1.1%	2.0%	1.0 - 3.0%
<b>Total</b>	<b>\$18,145.3</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	

**ACTUAL %**



**TARGET %**



**Teachers' Retirement System of the State of Kentucky**  
**Health Insurance Trust**  
**Quarterly Investment Performance**  
**Gross Returns**  
**For the Period Ended December 31, 2018**

FINAL

	<u>Market Value</u>	<u>Last Qtr</u>	<u>FYTD</u>	<u>1-Year</u>	<u>3-Year*</u>	<u>5-Year*</u>
<b><u>TOTAL PLAN</u></b>	\$ 1,076,453,805.09	-7.35	-4.29	-3.34	7.12	4.58
<i>Policy Benchmark</i>		-8.08	-5.25	-4.71	6.96	-
<b><u>Total Equity</u></b>	\$ 601,150,680.75	-13.26	-9.70	-9.55	6.77	4.52
<b><u>All Cap Equities</u></b>	\$ 32,237,797.87	-14.38	-9.03	-6.40	-	-
<i>Russell 3000</i>		-14.30	-8.20	-5.24	-	-
<b><u>Global Equities</u></b>	\$ 568,912,882.88	-13.20	-9.75	-9.76	6.91	4.60
<i>MSCI AC World IMI (Net)</i>		-13.28	-9.92	-10.08	6.49	4.17
<b><u>Fixed Income</u></b>	\$ 110,667,565.74	1.48	1.67	0.23	1.75	1.59
<i>Barclays Government Credit</i>		1.46	1.51	-0.42	2.19	2.53
<b><u>Core Real Estate</u></b>	\$ 31,859,785.66	1.94	5.43	9.26	-	-
<i>NCREIF ODCE (VW)</i>		1.76	3.88	8.35	-	-
<b><u>Non-Core Real Estate</u></b>	\$ 38,062,136.07	3.24	6.52	11.42	15.44	-
<i>NCREIF Property Index</i>		1.37	3.07	6.72	7.21	-
<b><u>Private Equity</u></b>	\$ 97,847,485.17	4.20	8.13	16.69	15.40	17.17
<b><u>Mature Private Equity</u></b>	\$ 8,178,909.00	5.88	15.78	22.25	15.84	15.63
<i>S&amp;P 500 plus 3%</i>		-12.88	-5.46	-1.52	12.53	11.75
<b><u>Private Equity &lt; 5 Years</u></b>	\$ 89,668,576.17	3.32	6.68	15.45	15.29	-
<b><u>Additional Categories:</u></b>	\$ 189,966,470.15	-2.26	0.33	1.40	6.48	3.59
<i>B of A Merrill Lynch High Yield Master II</i>		-4.67	-2.34	-2.27	7.27	3.82
<b><u>Cash (Unallocated)</u></b>	\$ 6,899,681.55	0.52	1.05	1.92	1.05	0.67
<i>90 Day T-Bill</i>		0.56	1.06	1.87	0.99	0.61

\*Returns are annualized for periods longer than one year

\*\* Prior to July 1, 2015, TRS did not benchmark overall fund performance. Effective July 1, 2015, the Board of Trustees approved a Policy Index that represents the returns of appropriate benchmarks for the various asset classes weighted by the mid point of the strategic range for the current fiscal year.

# Teachers' Retirement System of Kentucky

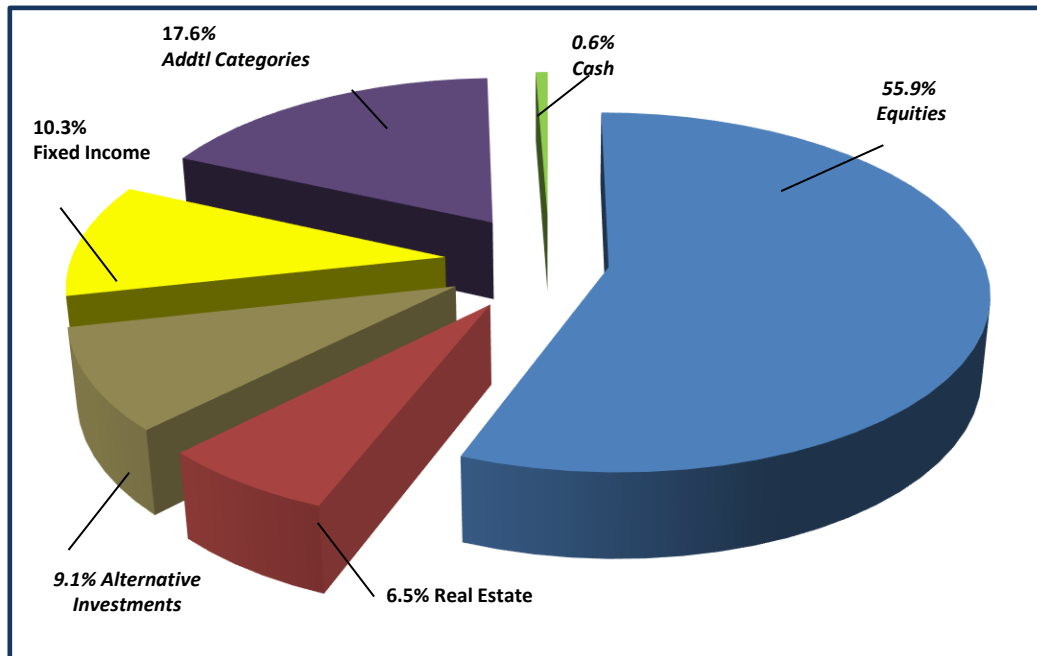
## Insurance Trust Fund

Quarterly Investment Update

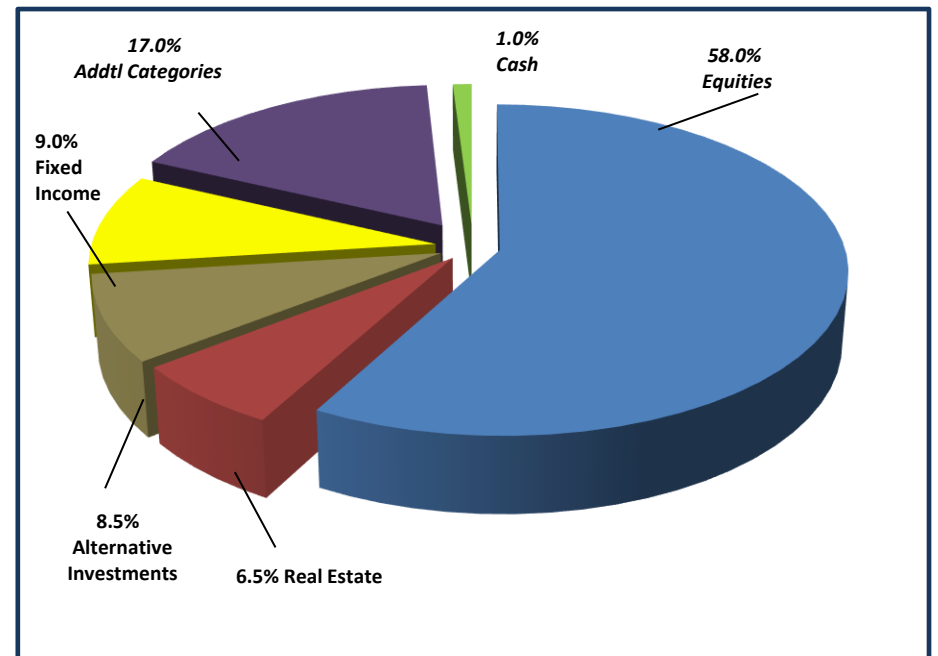
For the period ended December 31, 2018

(\$ in thousands)	\$'s	12/31/2018 Actual %	9/30/2018 Actual %	Target %	Strategic Ranges
Equities	\$601,150.7	55.9%	55.7%	58.0%	51.0 - 64.0%
Real Estate	\$69,921.9	6.5%	5.8%	6.5%	3.0 - 10.0%
Alternative Inv.	\$97,847.5	9.1%	7.5%	8.5%	3.0 - 11.0%
Fixed Income	\$110,667.6	10.3%	8.1%	9.0%	6.0 - 12.0%
Addtl Categories	\$189,966.5	17.6%	17.1%	17.0%	16.0 - 25.0%
Cash	\$6,899.7	0.6%	5.8%	1.0%	0.0 - 4.0%
<b>Total</b>	<b>\$1,076,453.8</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	

**ACTUAL %**



**TARGET %**



TOTAL BV INVESTED AT 9/30/18		\$ 15,335,869,765.13
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October Activity

Purchases	678,561,762.82	
Disposals	(713,712,086.29)	
Paydowns	(1,581,699.75)	
Redemptions	(15,626,539.09)	
Short-Term Pool Net	<u>37,291,804.83</u>	(15,066,757.48)

November Activity

Purchases	401,533,541.19	
Disposals	(368,756,337.81)	
Paydowns	(1,119,816.24)	
Redemptions	(25,448,925.37)	
Short-Term Pool Net	<u>86,110,576.21</u>	92,319,037.98

December Activity

Purchases	799,658,361.11	
Disposals	(699,374,782.15)	
Paydowns	(1,900,207.13)	
Redemptions	(3,791,695.58)	
Short-Term Pool Net	<u>(68,424,677.02)</u>	26,166,999.23

TOTAL BV INVESTED AT 12/31/18		<u><u>\$ 15,439,289,044.86</u></u>
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\* TRS recognizes investment transactions on the date they occur. Transaction settlements, generally, occur days following transactions. The interim period between transaction date and settlement date represents a "pending period". At the time this statement was produced, (\$6,753,018.24) in net transactions had occurred but had not settled. The statement does not include either expected cash receipts or disbursements associated with these pending trades. Upon settlement of these pending

Total Short Term	467,320,917
- Pending Payable	<u>6,753,018</u>
Net	<u><u>460,567,899</u></u>

# INVESTMENT ACTIVITY

## October 1, 2018 -- December 31, 2018

**Total Book Value Invested @ 10/1/18** \$ 15,335,869,765.13

**Purchases:**

352	Cash Equivalents	\$ 1,331,960,976.66	
122	Fixed Income Securities	415,707,467.20	
2165	Equity Securities	1,176,038,446.65	
29	Real Estate	41,376,175.88	
79	Alternative Investments	96,643,892.04	
137	Additional Categories	149,987,683.35	
<hr/>			
2884	Total Purchases		\$ 3,211,714,641.78

**Disposals:**

288	Cash Equivalents	\$ 1,276,983,272.64	
179	Fixed Income Securities	881,279,661.97	
316	Principal Paydowns	4,601,723.12	
23	Redemptions / Maturities	43,314,598.79	
1141	Equity Securities	651,862,829.39	
37	Real Estate	23,949,728.97	
129	Alternative Investments	91,861,506.91	
135	Additional Categories	132,889,479.01	
0	Additional Principal Paydowns	-	
6	Additional Redemptions / Maturities	1,552,561.25	
<hr/>			
2254	Total Disposals		\$ 3,108,295,362.05

**Total Book Value Invested @ 12/31/18** \$ 15,439,289,044.86

**Total Par Value Invested @ 12/31/18** \$ 15,436,208,015.74

**Total Market Value Invested @ 12/31/18** \$ 18,145,273,505.19

\* TRS recognizes investment transactions on the date they occur. Transaction settlements, generally, occur days following transactions. The interim period between transaction date and settlement date represents a "pending period". At the time this statement was produced, (\$6,753,018.24) in net transactions had occurred but had not settled. The statement does not include either expected cash receipts or disbursements associated with these pending trades. Upon settlement of these pending transactions, the net effect would be as follows:

Total Short Term	467,320,917
- Pending Payable	6,753,018
Net	<u><u>460,567,899</u></u>

TO: Board of Trustees of the  
Teachers' Retirement System of the State of Kentucky

FROM: Gary L. Harbin, CPA  
Executive Secretary

DATE: March 18, 2019

SUBJECT: Legislative Report

During the meeting, staff will report on the 2019 Regular Session of the Kentucky General Assembly.

Recommendation: This report is provided for informational purposes.

TO: Board of Trustees of the  
Teachers' Retirement System of the State of Kentucky

FROM: Gary L. Harbin, CPA  
Executive Secretary

DATE: March 18, 2019

SUBJECT: Executive Secretary's Observations and Comments

1. Statement of Financial Disclosure Due Monday, April 15, 2019: Each member of the Board of Trustees must file a Statement of Financial Disclosure with the Executive Branch Ethics Commission by Monday, April 15, 2019.

2. Nominating Committee for Board of Trustees Positions: The Nominating Committee, consisting of representatives from the 12 KEA districts and one representative from KRTA, met at TRS on Saturday, February 23, 2019. The committee met to nominate candidates for the active teacher trustee and the lay member trustee positions on the Board of Trustees for the terms expiring on June 30, 2019.

Current trustee Alison Wright was nominated for the first position on the ballot for the active teacher trustee position. Sonia Huff, Somerset, Kentucky, was nominated for the second position on the ballot. Jennifer Hawkins, Bowling Green, Kentucky, was nominated as the alternate.

Paul Bruce, Jr., Louisville, Kentucky was nominated for the first position on the ballot for the lay member trustee position. Bill Alverson, Paris, Kentucky, will fill the second position on the ballot. Greg Burton, Frankfort, Kentucky, will serve as the alternate candidate.

This year, for the first time, members of TRS will be able to vote electronically for trustees. The electronic ballot will be available to members from April 1 through April 21. Thereafter, in the first week of May, paper ballots will be mailed to all active and retired members who did not vote by electronic ballot. Electronic and paper ballots will be tallied by the Commissioner of Education and the results of the election will be announced at the June 17, 2019, regular quarterly meeting of the board.

3. KEA Delegate Assembly: TRS staff will be available at the annual KEA Delegate Assembly to provide retirement information to persons attending the conference. TRS employees are looking forward to being available to assist our members at the conference on April 3-5, 2019. TRS has attended this meeting for the last several years, and the outreach efforts have been a success.

4. Junita Losey Scholarship Fund Update: Scholarship checks in the amount of \$2,000 have been sent to each of the eight public universities in Kentucky. TRS is expecting responses from the universities that the scholarship money has been received. Recipients may apply scholarship funds toward tuition, books or fees.

In addition, the Campbell County School System selects a student in May, who intends to enroll in one of Kentucky's public universities and major in education, to receive the Junita Losey

Scholarship. The student must enroll in a Kentucky public university in the fall and then notify TRS regarding verification of their enrollment. At that time, a check in the amount of \$1,000 is sent to the university that the student selected to attend. Upon completing their first university semester, the student is to inform TRS that they are still in compliance with the scholarship criteria, and TRS will then distribute another \$1,000 check to the university the student is attending.

5. Executive Secretary's Meetings: Staff has had meetings with several persons and groups recently. The board will receive reports concerning the following meetings:

December 17, 2018	Meeting with regional university presidents
December 18, 2018	Meeting with public relations consultant
January 7, 2019	Meeting with Treasurer Ball
January 8, 2019	Meeting with regional university presidents
January 11, 2019	Presentation to Kentucky Chamber of Commerce board
January 16, 2019	Meeting with JCTA President
January 25, 2019	Meeting with public relations consultant
January 29, 2019	Meeting with Todd Asset Management
January 31, 2019	Meeting with constituency groups
February 6, 2019	Meeting with constituency groups
February 7, 2019	Meeting with Representative Lewis
February 11, 2019	Conference call with public relations consultant
February 22, 2019	Meeting with Senate President Stivers
February 23, 2019	KEA Nominating Committee meeting
February 26, 2019	Conference call with Dave Adkisson
February 28, 2019	Meeting with Speaker David Osborne
March 5, 2019	Attended Know Your Rx Coalition board meeting
March 8, 2019	Meeting with Fort Washington Investment Advisors

6. Pharmacogenetics Pilot Project: In June 2017, the board approved contracting with Coriell Life Sciences to undertake a pilot pharmacogenomics project. The pilot is being conducted with a group of volunteers from the TRS Medicare Eligible Health Plan. Staff will be available at the meeting to update the board on recent activities in the program.

7. Next Meeting: The next regular quarterly meeting of the Board of Trustees will be on Monday, June 17, 2019.

# The Power of Pharmacogenomics and its Impact on Healthcare



TEACHERS'  
Retirement System



KNOW  
YOUR **Rx**  
COALITION

CORIELL  
LIFE SCIENCES

**AON**  
Empower Results®



## Who We Are

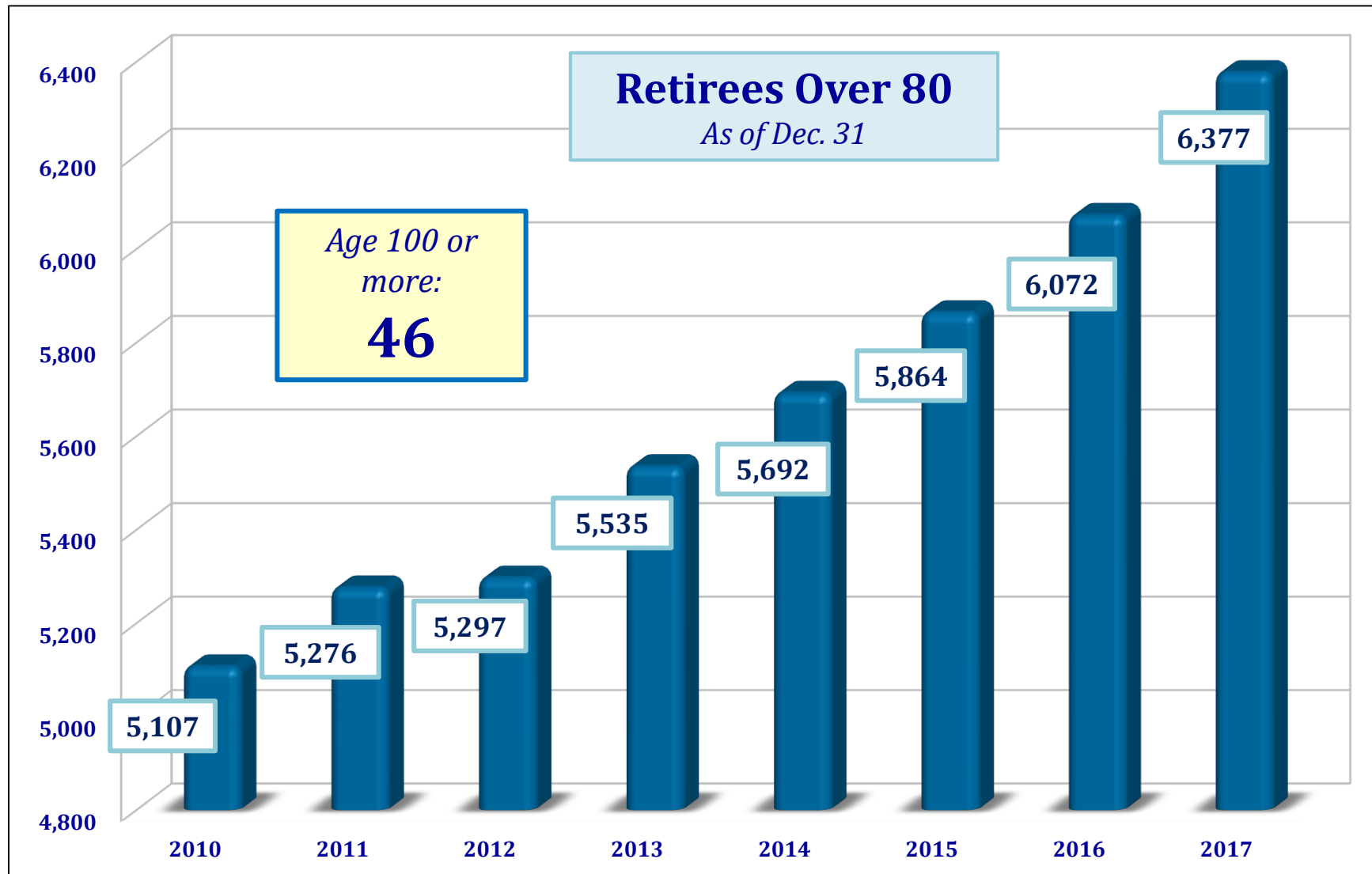
The Teachers' Retirement System is a defined benefit "group retirement" plan that pays a defined amount upon retirement based on length of service and final average salary of the employee, along with a retirement multiplier. TRS retirement eligibility is determined by the employee's age and years of service. The service retirement annuity is a guaranteed lifetime benefit.

# TRS Population

## Member Recipients

Females	72%
Males	28%

# Longevity for TRS Retirees



# TRS Health Benefits

**Retired teachers' health insurance provided through two plans:**

## **Medicare Eligible Health Plan (MEHP)**

Medicare-eligible or 65 & over

- A Medicare Advantage plan provided through UnitedHealthcare (UHC) and a Part D prescription plan provided through Express Scripts
- Exclusively TRS



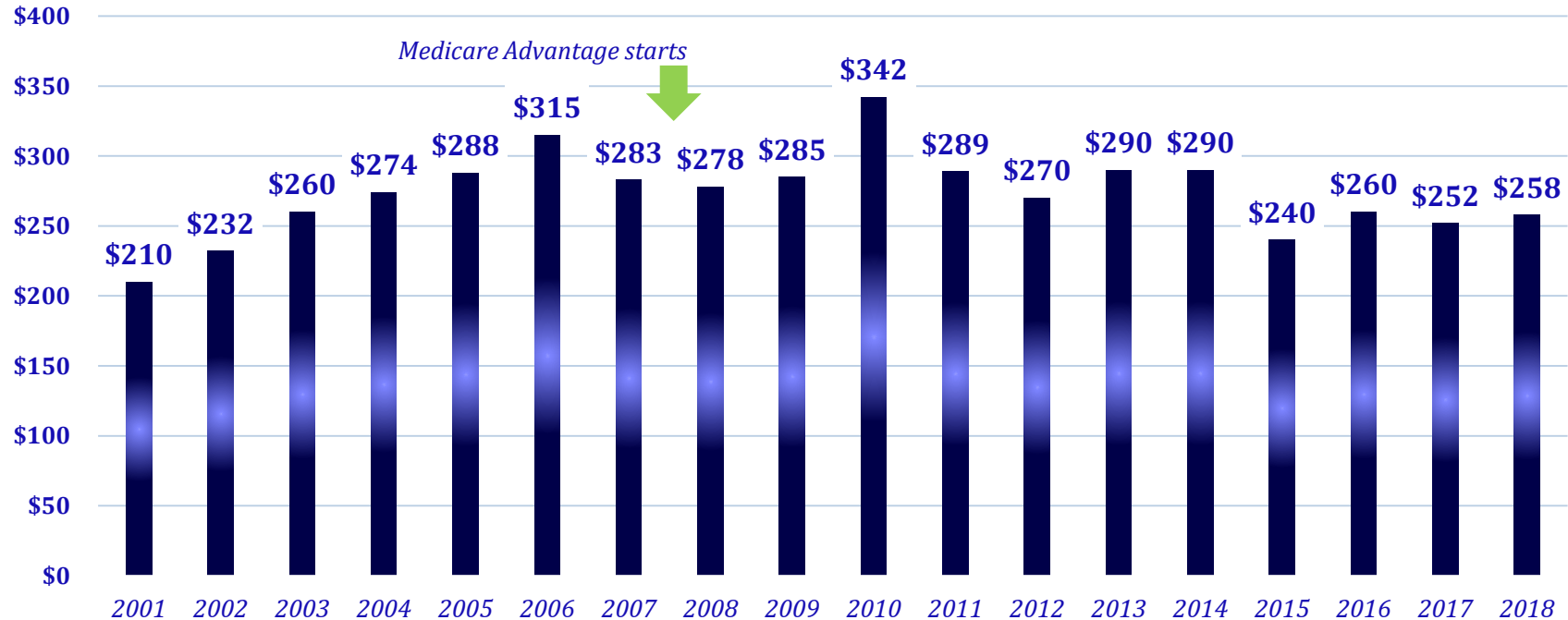
## **Kentucky Employees' Health Plan (KEHP)**

Under 65 and not Medicare-eligible

- Provided through Anthem and CVS/Caremark
- Same fund as active teachers and state employees



## TRS MEHP Premiums



### *Still Bending the Trend*

Now, in 12th year, still saving \$30 per person per month compared to Medicare supplement/complement projected medical costs for 2007, which equates to \$12.2 million annually on Medicare Advantage alone (not including Medicare Part D).

# TRS MEDICAL INSURANCE

Funded Status



# What TRS Data Shows

- 84% of TRS retirees are on medications that are influenced by genetics

- 23,000-plus TRS retirees may need to stop or change at least one medication



## *What the data means – safety and savings*

Taking medications that don't work for you is costly to your health and to your TRS insurance fund

- 10% of members should stop prescription immediately
  - Savings of \$1.7M
- 57% of members are taking the wrong dosage
  - Savings of \$10M
- 33% of members have a better alternative available
  - Savings of \$10M

Using de-identified claims information, CLS provided the pension fund with an in-depth analysis of the potential return on investment with the program.

# MEHP – What We Know

From TRS data

74	Average age of enrollees
6,000+	Retired teachers 80 and older
35,000	MEHP retirees aged 65 to 107
\$105 million	Annual spending



15

Average # of prescriptions



75%

Members with high bp/heart disease



58%

Members with high cholesterol



50%

Members with pain/inflammation

Based on 12 month case study involving 34,000 members

Nationally, not just 65 and over



50%

of the medications patients take are ineffective

4<sup>TH</sup>



Leading cause of death in the US are

Adverse Drug Reactions.

Source: Coriell Life Sciences

# TRS Pharmacogenomics Pilot Project

## Team Effort

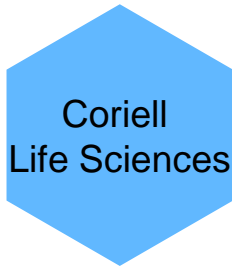
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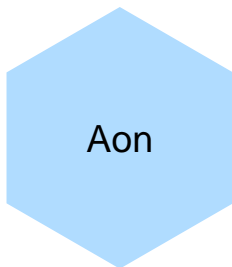
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Know Your Rx is a purchasing / member services coalition for public sector and non-profit entities. Its pharmacist staff are uniquely positioned to provide Medication Therapy Management (MTM) to all members through its pharmacist intake and outreach programs. There are currently 12 pharmacists on staff with two dedicated to the Pharmacogenomic TRS project.

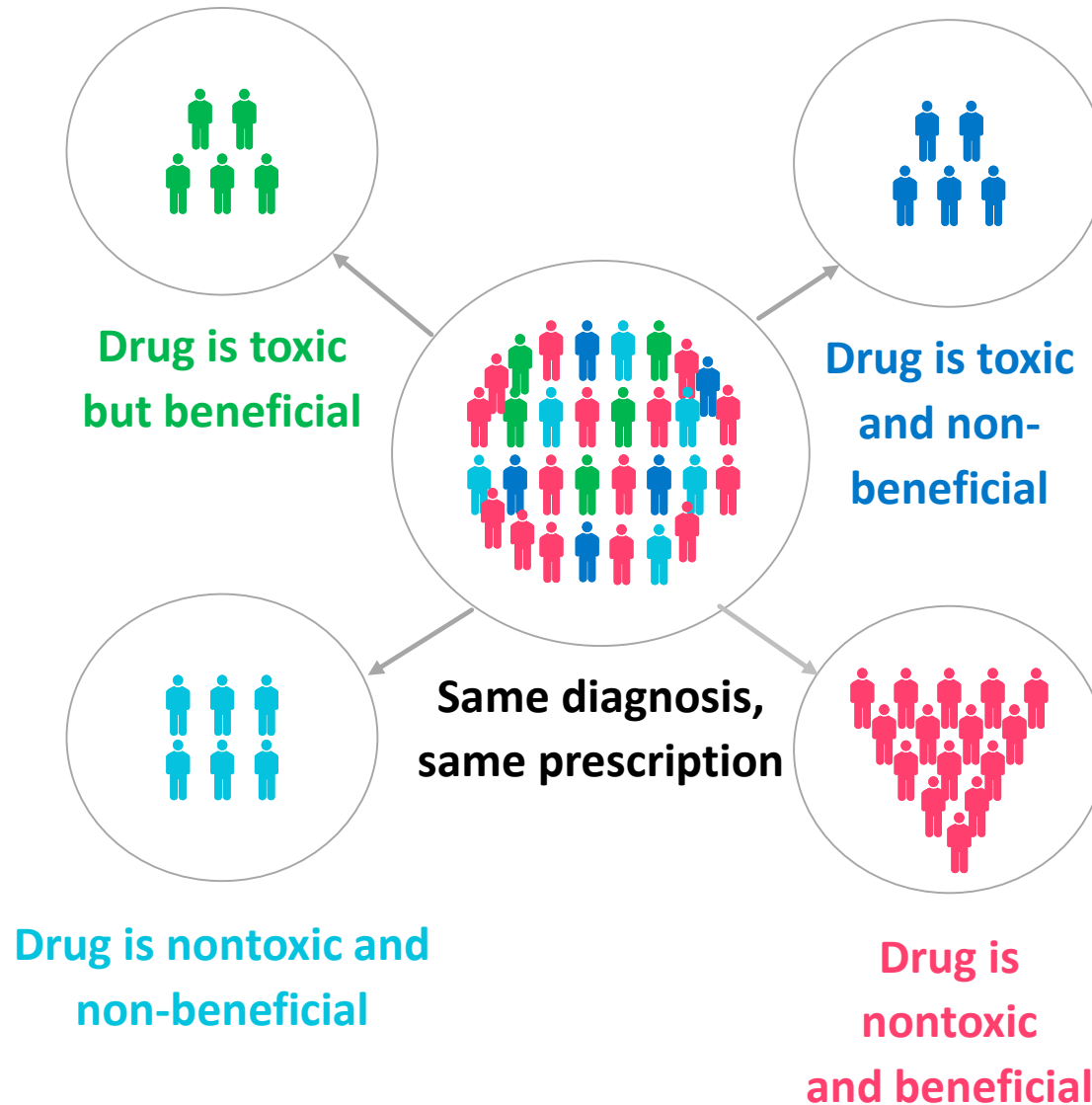


Coriell Life Sciences (CLS) is the commercial venture of the world-renowned Coriell Institute for Medical Research, a non-profit biomedical research institution, founded in 1953, dedicated to studying the human genome. In 2007, the Institute launched the Coriell Personalized Medicine Collaborative (CPMC), a research study seeking to understand the value of genetic risk and pharmacogenomics in clinical decision making and healthcare management. The results of that study led to the founding of Coriell Life Sciences in 2013. CLS is a provider of genetic laboratory interpretation and reporting services.



Aon has been the consultant for TRS since 2008. Aon provides RFI guidance, overall strategy, consulting recommendations, and project oversight for the Pharmacogenomic project.

# YOUR DNA MATTERS



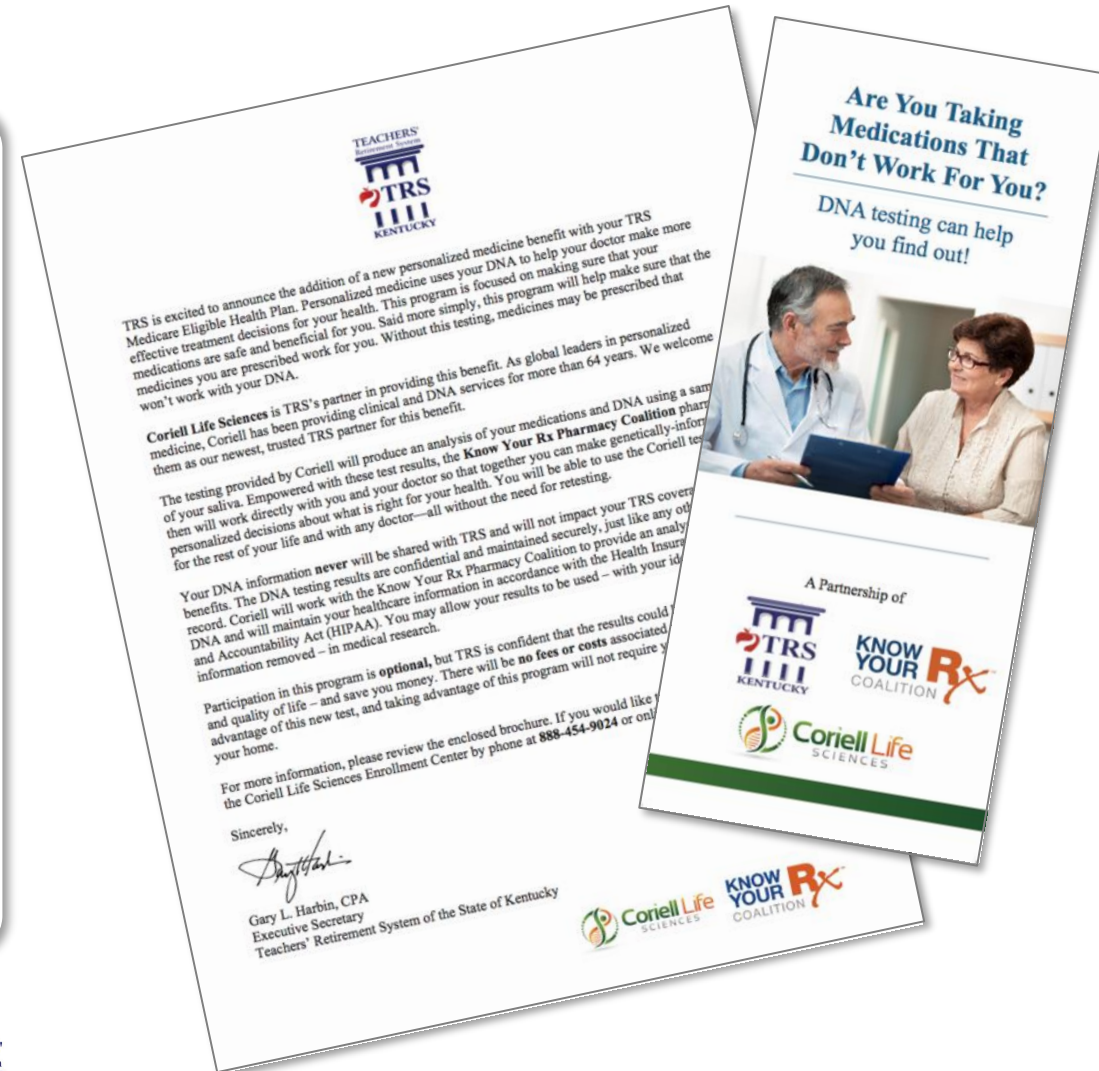
## “Pharmacogenomics” (PGx)

Using DNA to see what drugs  
will be safe and effective

# INVITE AND ENROLL MEMBERS

## Key Messages:

- ✓ We are making smarter use of healthcare dollars with a new personalized medicine program.
- ✓ We have engaged partners to work with your doctor.
- ✓ This new benefit will test your DNA to make sure your medications will be safe and effective for you.
- ✓ The analysis and test results will only be used by pharmacists and your doctor. Your information will not be shared with us.



# DNA COLLECTION KITS

CORIELL  
LIFE SCIENCES

DNA Collection kits sent  
to members' homes  
upon enrollment



Kits returned in same box,  
processed by lab  
within 2 weeks



# Know Your Rx Coalition *Pharm-Assist* Offering

**MONDAY-FRIDAY 8AM –6 PM ET**

[KYRx@uky.edu](mailto:KYRx@uky.edu) [www.KYRx.org](http://www.KYRx.org)

- Contact retirees with lower cost prescription alternatives
- Contact Prescribers and Pharmacies on retirees' behalf
- Guide retirees to lowest cost medication options (\$4 generic lists, copay cards, etc.)
- Contact Express Scripts or CVS on retirees' behalf as needed
- Provide medication information and prescription coverage information specific to retirees' plan
- TRS joined drug purchasing coalition in January 2012
- Coalition makes thousands of outbound proactive calls due to tiering and formulary changes
- Since joining the coalition, the TRS generic fill rate has increased from 73% to 88%

**Know Your Rx Coalition**

**855-218-5979**

**Clinical Director**

Lucy Wells

**Dedicated Clinical Pharmacists**

Travis Albrecht  
Marissa Boelhauf  
Lea Goggin  
Amy Griesser  
Matt McMahan  
Stacy Poskin  
April Prather  
Allison Russell  
Patricia Walker  
Zach Wilkerson

# Solution: TRS Personalized Medicine Partnership



You



Your Doctor



Your Pharmacist



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# Solution: Comprehensive Medication Safety Management Pilot

1. Collect genetic information
2. Empower pharmacists with Medication Therapy Management software & genetic guidance
3. Communicate the Medication Action Plan



## GeneDose Medication Action Plan



Patient: Fisher, Doris  
Date of Birth: Jan 1, 1931  
Gender: FEMALE  
Patient Identifier: 487655

Created by: Coriell Life Sciences  
Pharmacist: Megill, Scott  
Phone:  
Email: smegill+2@coriell.com

### 1. About This Report

This GeneDose Medication Action Plan (MAP) is the result of a Medication Risk Assessment that consists of clinical pharmacogenomic assays that together with clinical, demographic, lifestyle information, and pharmacist's review provide a Medication Action Plan. Pharmaceutical safety, healthcare best practices, lifestyle factors, side effects, medical conditions, and more were analyzed.

The Pharmacist's Notes & Recommendations below provide clinical suggestions for your consideration.

### 2. Results

#### Suggested Changes to Current Medications:

--- Remove ---	+++ Add +++	/// Do not Change ///
Oxycodone Carisoprodol	Hydromorphone Chlorzoxazone	Amitriptyline Fluconazole Dapagliflozin Doxycycline Amlodipine Clobetasol Lansoprazole

Pharmacist's recommended changes to patient's current medications based on the Medication Risk Assessment.

#### Pharmacist's Notes & Recommendations:

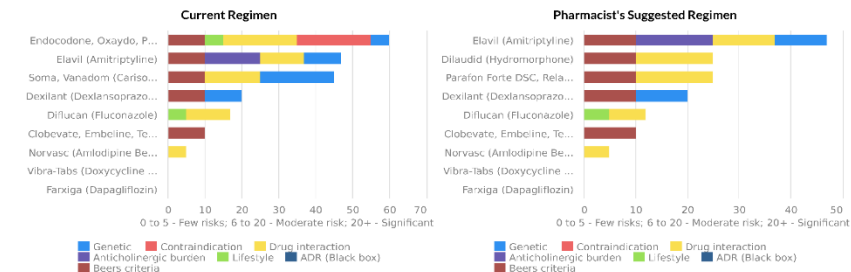
We think this patient should be on these meds

### 3. Next Steps

Changes in medication dosing are recommended as noted in order to reduce risk of adverse reactions and potential therapy failures. Supplemental risk information can be found in Section 4.





### 4. Supplemental Information: Medication Risk Charts

These charts show each medication input into GeneDose Medication Risk Assessment for the patient. The longer a bar is in the chart, the more risky the medication may be.



Teachers' Retirement System of Kentucky  
Personalized Medicine Program

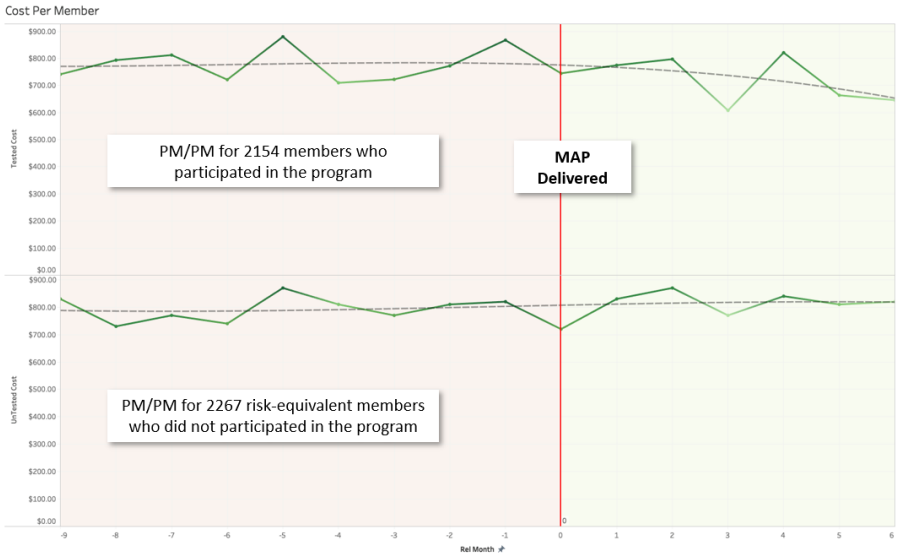
Date: 02/18/2019

	<b>Invitations</b> Invited: 35,680
	<b>Enrollment</b> Enrolled: 6,931 88% By Phone
	<b>Sample Processing</b> DNA Extraction and analysis: 107
	<b>MTM Review</b> Results Available: 5,048 Initiated/ Complete: 3,348

# METRICS OF SUCCESS

- ✓ 64% resulted in medication change recommendation
- ✓ 94% of recommendations accepted by prescribers

## COST REDUCTION



CORIELL  
LIFE SCIENCES

17%

Reduction in cost-to-plan  
spending after 6 months

2.5%

Increase in control group





**Your TRS  
WON **FIRST PLACE** in  
SALGBA Challenge  
for its pharmacogenomics pilot**

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*Presented at 2018 SALGBA National  
Conference*



# DNA TESTING IS NOT SUFFICIENT

Need to bring together rigorously-vetted genetic guidance with **dozens of other factors** of patient-specific prescribing risk.

**Healthcare providers should be empowered with answers** rather than research materials.

Real-time modeling should allow pharmacists and doctors to see the results of medication changes **before** they experiment with them on their patients.



## Access to Results of Pharmacogenomic Testing Information

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- **A Pharmacogenomic process model must include future access to gene/drug information. The Client is purchasing not only the testing and results but the platform to store pharmacogenomic results for access by providers. Coriell's proprietary platform is GeneDose Live**
- **Currently there is No direct access to results through Electronic Medical Record (EMR).**
- **EMR's are not currently formatted to handle pharmacogenomic results.**
- **Results can be provided direct to the consumer /member. This may however cause confusion over how and when to use the results.**
- **TRS members utilize Know Your Rx Coalition which provides provider and member access and ongoing interpretation of results.**

## Current Solution to Embed Results in EMR

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- **Must identify prevalent provider populations, Hospitals and doctors.**
- **Embed results into hospital EMR on a case by case basis assuming active medical record exists for the member.**
- **Know Your Rx can work with physician to embed results into physician directed EMR**
- **Member / Consumer can access information through a model similar to Know Your Rx**

**There must be an active process to make Pharmacogenomic results information available to providers**

# MEMBER FEEDBACK

I heard about DNA testing regarding prescriptions on a national news story 2 years ago. I thought at that time that this was the future of medicine. I never dreamed that I would be asked to be part of the pilot program for DNA testing for prescriptions in Kentucky. Thanks to Jane Gilbert and Gary Harbin for having the foresight to see that this would be very important to our Kentucky Retired Teachers. **I did the testing and thank goodness I did because 2 of my medicines were not working well together.** Thanks to Lea G. at the (KY)Rx Coalition for working with me to get the medicine issue resolved. Once again, I am proud to be a retired teacher in Kentucky where TRS is looking out for the well being of its members!!!

The results showed that the cholesterol medicine I was on was not metabolizing well. The [KY]RX nurse said there were other drugs in a different family that could work without the same problem. My doctor was notified and the change was made. **I have far more energy now.**

*... (The pharmacists) did say that one of my medications that I take once a day was only working for the first few hours due to my DNA and that I should discuss it with my doctor. My doctor had the report, he checked it and agreed with the pharmacist. I now take that pill 2 times a day and I can tell a difference in my stamina for the afternoon. As friends get together, the DNA test is the topic of conversation. The people who have completed the process loved it, the ones who haven't gotten their results are anxiously awaiting and the other people are searching for the number to call so they can start the process. Thanks!*

## Member Impact



- TRS member presented to the ER with Myocardial Infarction
- Member previously had Pharmacogenomic gene panel test with results delivered by Know Your Rx Coalition Pharmacist.
- Member had hospital stay with surgery for stint implant.
- Upon Discharge member was prescribed an anticoagulant.
- Prior to picking up the drug the member contacted Know Your Rx to review the gene panel test results.
- The Pharmacist that reviewed the results identified an interaction with the specific drug prescribed which lead to a change in prescribed drug.



## ***Our Members Come First!***

*As always, you may contact  
TRS if you have any  
questions or concerns.*

**Monday through Friday,**

**8 a.m. – 5 p.m. ET**

**800-618-1687**

**502-848-8500**

<https://trs.ky.gov>