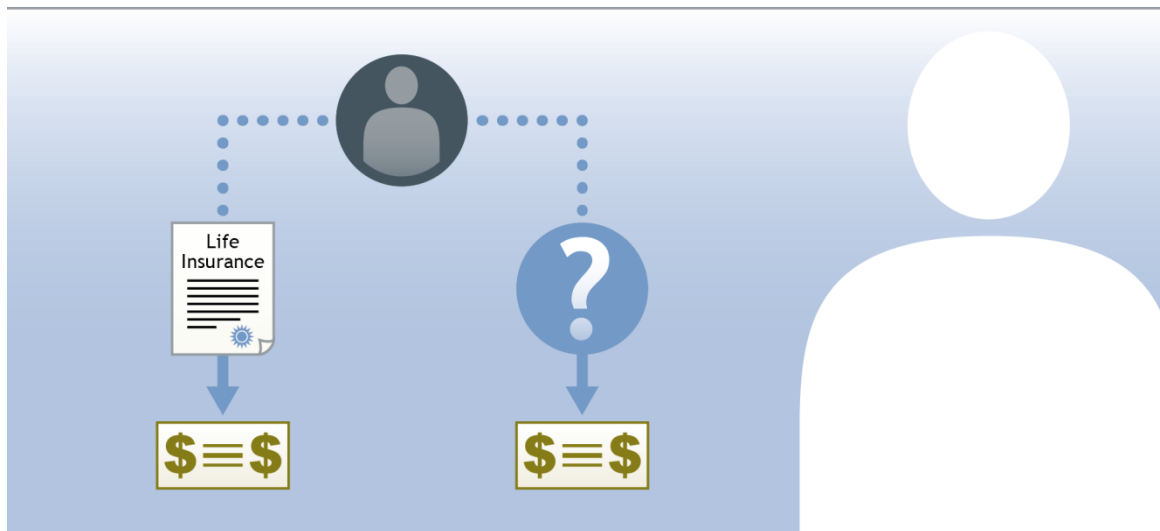# The Effective Rate of Return of Life Insurance

Designed for:

Male, 40 years old, Non Smoker

Designed by:

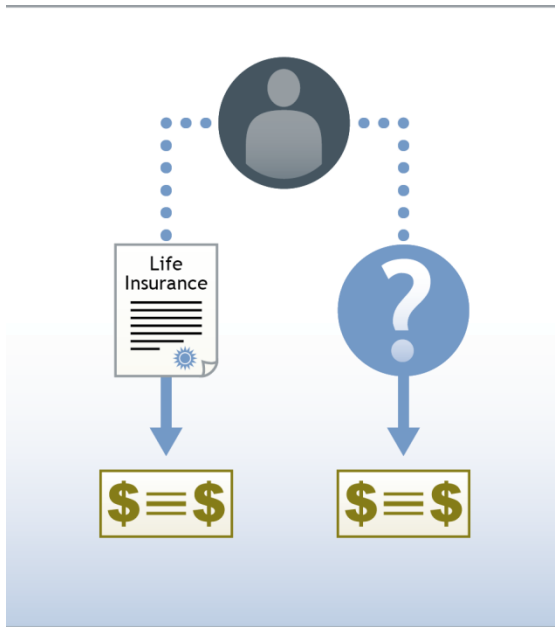Date: **April 6, 2023**

British Columbia

Background

A permanent life insurance policy is a financial tool that efficiently provides cash at death.

But a life insurance policy is only one way of providing cash at death. How do you compare the efficiency of life insurance against other financial strategies?

The Traditional Approach:
## Internal Rate of Return (IRR)

The traditional method used to measure the efficiency of life insurance is to calculate the Internal Rate of Return (IRR) at a probable date of maturity.

IRR calculations treat the policy premiums as cash outflows and the death benefit as a cash inflow. It then determines what rate of return those premiums would need to generate if they were invested elsewhere, so that they would accumulate to an amount equal to the policy death benefit. This rate of return is then compared to other investment opportunities to determine the relative effectiveness of life insurance as a financial instrument.

Most life insurance policies have pre-determined premium levels and premium payment periods; however, the date when the death benefit will be paid is unknown. A common practice is to assume that event will occur at the insured's life expectancy.

For example, a Male, 40 years old, Non Smoker(100) making an annual premium deposit of $10,000 for life in a 53.50 % marginal tax bracket, would need to achieve a 6.50 % pre-tax return each year in an alternate investment to produce $1,000,000 of after tax capital at life expectancy (age 85).
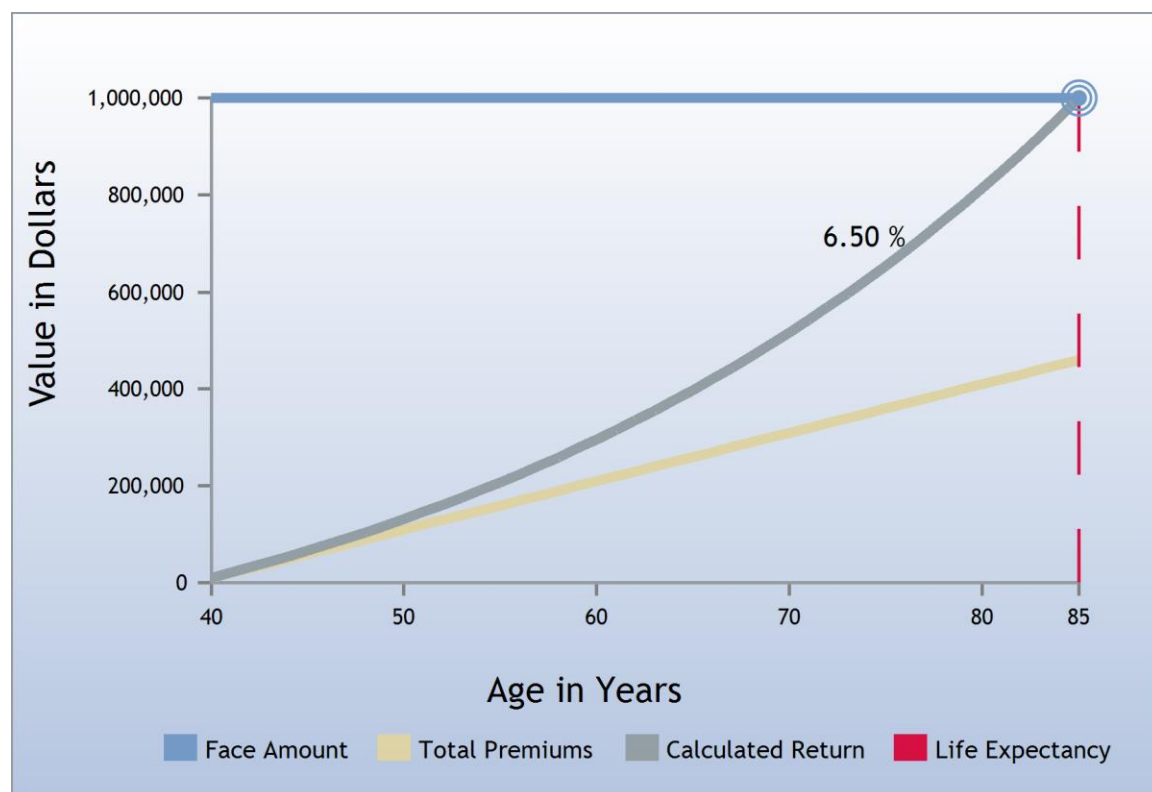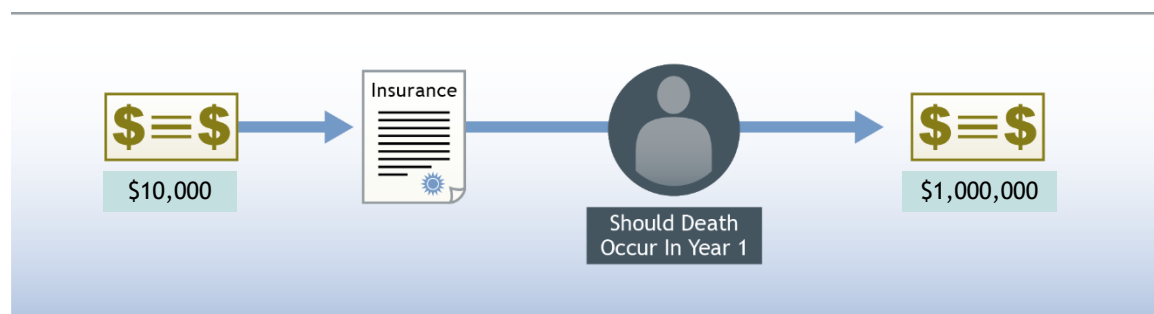
IRR Shortcoming:
Accounting for an Earlier Death

Permanent life insurance pays the full coverage amount of the policy regardless of when death occurs, a major advantage over other capital accumulation strategies .
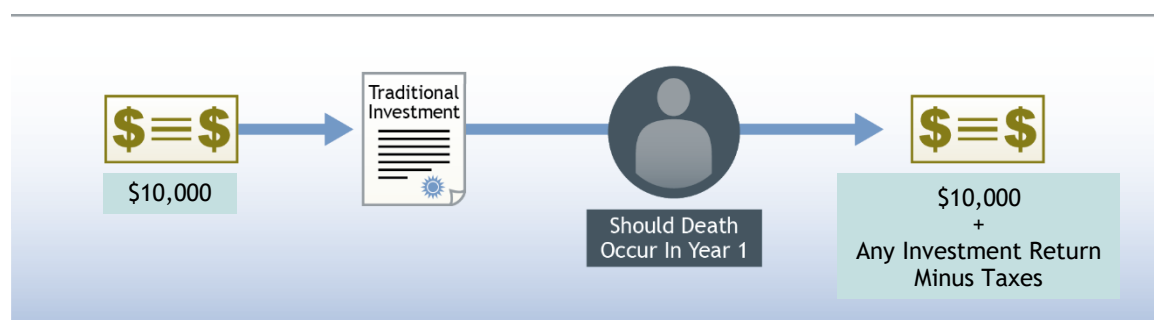
For example, should death occur in the first year, life insurance would pay the full target amount of $1,000,000, while the alternate investment would only provide the deposits plus any accumulated investment return.

The traditional IRR calculation does not account for this early payout possibility. A true comparison calculation should include an adjustment for the insured payout contingency.

Life Insurance

$10,000 → Insurance → Should Death Occur In Year 1 → $1,000,000

Alternate Investment

$10,000 → Traditional Investment → Should Death Occur In Year 1 → $10,000 + Any Investment Return Minus Taxes

See **Some Important Notes** at the end of this presentation.

Introducing a New Approach: Effective Rate of Return (ERR)

If we assume that we purchase term life insurance each year to cover the shortfall we could remove the payout risk of an early death. To account for the annual insurance purchase, we would subtract the cost of that insurance from any investment accumulation, giving us a more accurate picture of the true return on the premium investment in the permanent policy.

For example, if our target accumulated amount (or death benefit) is $1,000,000 and the first year total deposit is $10,000, should death occur in the first year there would be a shortfall of $990,000 in our accumulated investment fund. That shortfall could be covered by purchasing one year of term insurance. The cost of that insurance coverage would be deducted from the accumulated funds. The result would be a $1,000,000 payment upon death in year one.
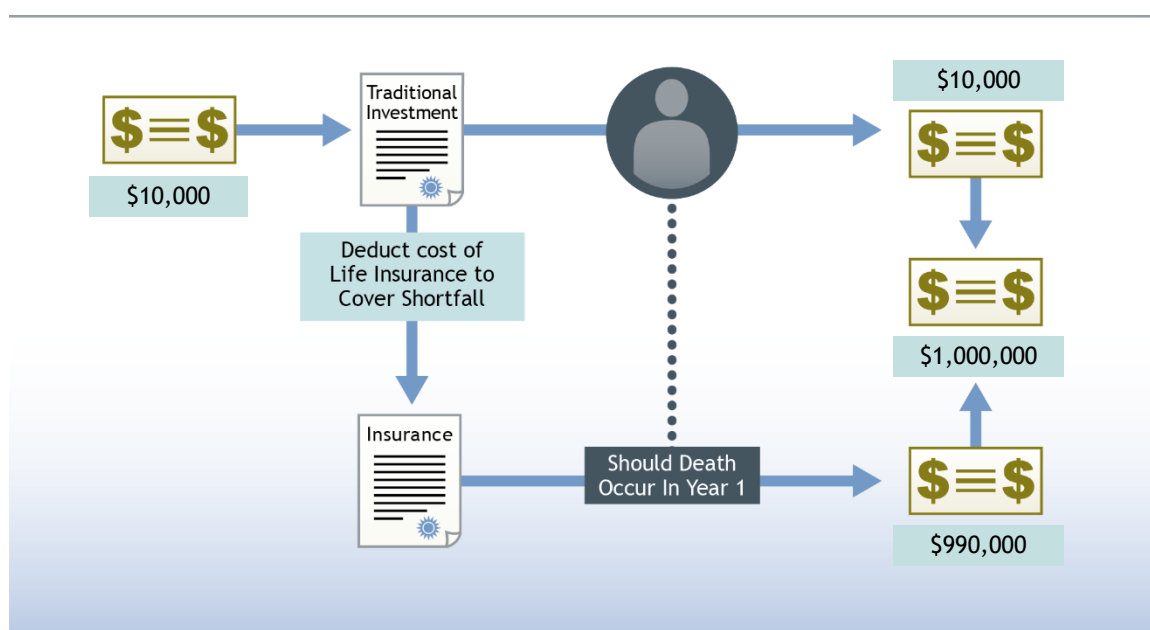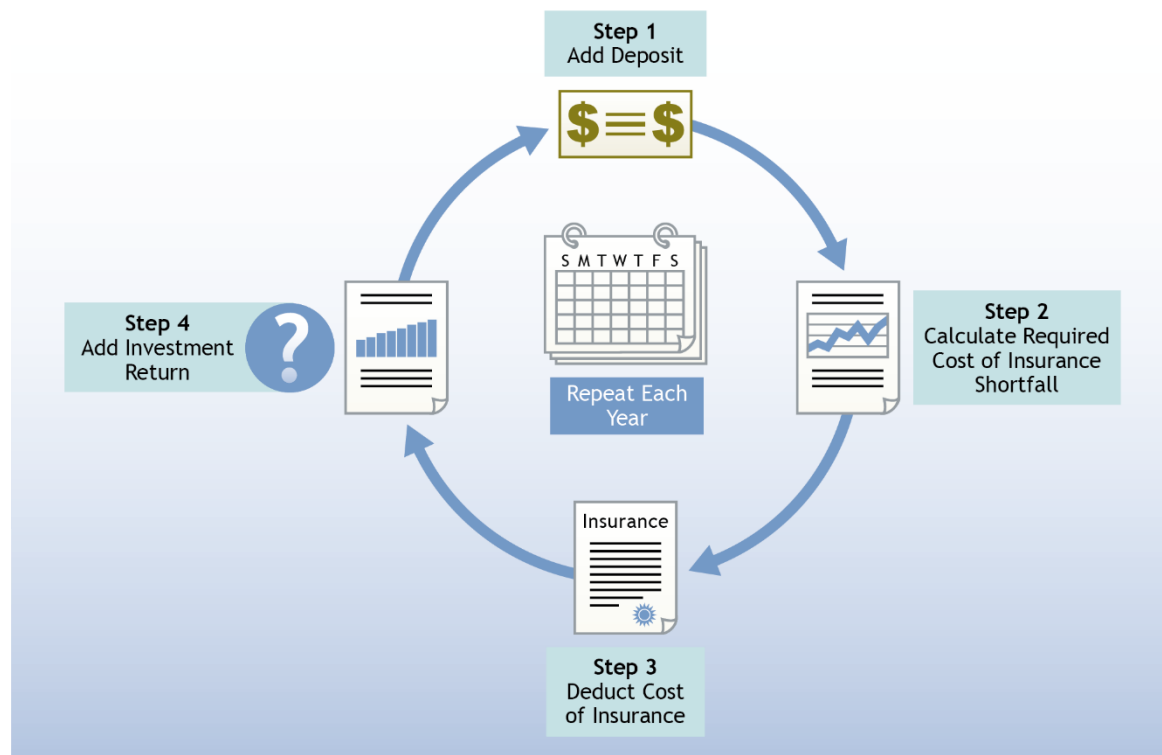
Effective Rate of Return:
The Calculation Cycle

To calculate the ERR at any point in time, the four steps in the calculation cycle are repeated annually:

1. Any new deposits are added to the investment accumulation fund.

2. The shortfall from our target accumulation amount (should death occur in that year) is the amount of term life insurance required to make up the difference for that year.

3. The cost of the insurance coverage is deducted from the accumulation fund.

4. The investment returns on the remaining accumulation fund are added to the balance.

The ERR calculation solves for the investment return required each year in step 4 in order to achieve the target accumulation amount at a point in time, for example, life expectancy.

Step 1
Add Deposit

$ = $

S M T W T F S

Repeat Each Year

Step 4
Add Investment Return

?

Step 2
Calculate Required Cost of Insurance Shortfall

Insurance

Step 3
Deduct Cost of Insurance

Effective Rate of Return:
A True Measure of Efficiency

Using our earlier example, a Male, 40 years old, Non Smoker(100) with $1,000,000 of coverage and an annual premium of $10,000 in a 53.50 % marginal tax bracket, the Effective Rate of Return (pre-tax equivalent) at life expectancy (age 85) would be 9.64 %.

In other words, an alternate investment would need to return more than 9.64 % annually (pre-tax) to accumulate to an amount equal to the policy death benefit, while providing the same potential payout each year there is a risk of death.

Since death is unpredictable, this new method of measuring insurance efficiency allows us to look at the ERR of the permanent policy for dates other than just life expectancy.

The table shown below illustrates the calculation for dates at and around life expectancy.

Policy Year	Attained Age	Effective Rate of Return		
		After Tax	Pre-Tax Equivalent	
36	75	6.11 %	13.07 %	
41	80	5.13 %	10.97 %	
46	85	4.52 %	9.64 %	Life Expectancy
51	90	4.17 %	8.88 %	
56	95	4.00 %	8.50 %	

Notes on the ERR Calculations

ERR is a better method than IRR to measure the efficiency of a life insurance contract against other investments, as it accounts for the risk that death may occur earlier than life expectancy.

Although there are many factors to consider when allocating funds between insurance and investments, the ERR calculation provides a quantifiable approach that can contribute to the decision process.

The calculations described are done on a monthly cycle. Insurance costs are calculated using annual yearly term rates and are typical of rates embedded in universal life insurance policies marketed in Canada. The costs also include any policy fees and premium taxes based on the specified province.

Some Important Notes

This presentation is for general information purposes. The information contained in this presentation must not be taken or relied upon by the reader as legal, accounting, taxation or actuarial advice. For these matters readers should seek independent professional advice. Please refer to insurance company illustrations, policy contracts and information folders regarding any insurance matters referred to in this presentation, as those documents will govern in all cases.

This presentation discusses many features of a life insurance policy and includes examples that are based on the facts and assumptions noted. Any premiums or cash values illustrated in this presentation have been calculated without verification from the illustrated insurance company and must be confirmed before proceeding with any purchase. The illustrated insurance company has not reviewed this presentation and is not responsible for its content. The illustrated values are neither estimates nor a guarantee of future performance. Actual performance will vary over time and may differ from the example illustrated. Any tax calculations are provided as examples only.